# PAINT and VARNISH Production

THE TECHNICAL MAGAZINE FOR MANUFACTURERS OF PAINT, VARNISH, LACQUER AND OTHER SYNTHETIC FINISHES

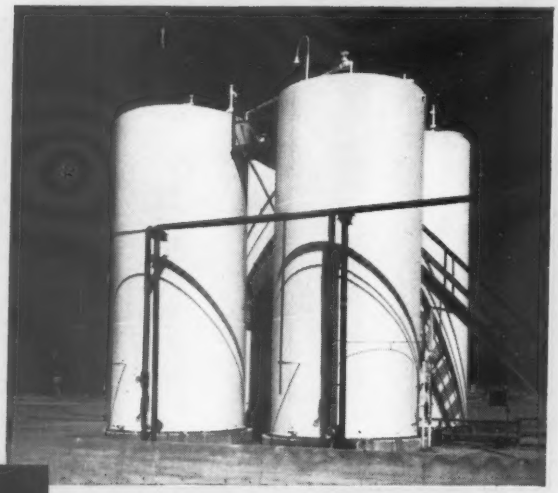




MARCH
1955

# EPON® RESIN does it!

## New paint lasts years ...resists corrosive spillage at Diamond Alkali plant



## HERE'S HOW...

PAINT LEADS a hard life at the Diamond Alkali Company agricultural chemicals plant in Houston, Texas . . . and no ordinary paint can survive there for long!

A few reasons for paint failure: Processing vessels and storage tanks are subjected to spillage of chlorinated hydrocarbons and benzene, and some also to heat. In parts of the plant, painted surfaces are exposed to the highly corrosive fumes of hydrogen chloride and sulfuric acid.

In their search to find a tougher, longer lasting paint, Diamond Alkali maintenance men tried coatings of many types, including heavy duty maintenance finishes. Some "washed off" immediately; some lasted 6 to 8 months. Finally, Epon resin coatings based on the XA-200 formulation were tried — and found outstandingly successful.

The Epon cold-cured paint, applied by spraying throughout the entire plant, has been in service for *more than two years with no failure.* Painting costs — for both material and labor—are a mere fraction of what they formerly were, reports Diamond Alkali.

Paint users are rapidly recognizing the basic advantages of Epon resin-based formulations—excellent adhesion, resistance to abrasion and impact, ability to withstand extremes of heat, humidity and corrosive atmospheres. Your Shell Chemical representative will explain how Epon resins can improve your own paint and enamel formulations. Write or telephone for SC:52-31, "*Epon Resins for Surface Coatings.*"

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The Celanese technical service department is set up to give detailed assistance in the development of paints with polyvinyl acetate emulsions. Use the coupon below to receive the New Product Bulletin on PVAc emulsions for paints or write to

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# PAINT and VARNISH Production

(REG. U.S. PATENT OFFICE)

Formerly PAINT and VARNISH PRODUCTION MANAGER
(Established in 1910 as The Paint and Varnish Record)

VOL. 45 MARCH, 1955 NO. 3

NEXT ISSUE

Our April number will carry an article the flocculation of copper phthalocyanine blue pigment. This article is concerned with research work done in the determination of the effect of variation in the composition of the organic dispersing medium upon the flocculation of this pigment. Mixtures of dispersions of pigment in mineral oil and raw castor oil with various organic solvent media, as well as direct dispersions of pigments in solvents, were studied. Sedimentation volume, rheological and photomicrographic methods were also employed in this study.

## FEATURES



## DEPARTMENTS



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## "Do-It-Yourself" Helping Painters

AT THE recent Painting, Decorating Contractors' Convention held in New Orleans last month, William Gelfan, who is president of the Painting and Decorating Contractors of America, stated that the national movement for "do-it-yourself" actually had benefitted the painting contractor.

"It had made the public more aware of painting and decorating," he said.

"The publicity on 'do-it-yourself' has created an urge in a large number of people to go buy buckets of paint, brushes and other equipment to paint a room or house. Only in rare cases will they buy all materials and equipment necessary to do the job right.

"When they get home and are surrounded by their materials, many people become discouraged by the problem and call in an expert to do it. Some get bogged down in the middle of the job and call an expert to finish it. A very large number finish the job and then call the expert to do it over."

Gelfan went on to say that every person who buys a can of paint, with "do-it-yourself" on his mind, is a potential customer of the painting and decorating contractor.

He further stated that the "do-it-yourself" movement has actually made home-owners style-conscious as never before, thus making the mass market of home owners more selective. This new style selectivity has benefitted the expert contractor greatly.

There is no doubt that the "do-it-yourself" movement at first offered a challenge to the paint contractor. To hear that this movement has been an asset to contractors is indeed heartening. It is evident that the painting contractor is no longer fighting "do-it-yourself," he has joined it!

## "Push-Button" Industry Needs Experts

IN THE wake of keener competition coupled with technological progress, automatic control has assumed an important position in our process industries during the last year.

Commenting on the forthcoming Western Plant Maintenance and Engineering Show to be held in Los Angeles this summer, H. Leslie Hoffman, electronic chairman of the Los Angeles Chamber of Commerce pointed out that the rapidly approaching "push-button" industrial age is revealing a need for a new kind of technician for whom there is very little curriculum in our educational system. He said:

"A great many men of highly specialized skills will be needed to maintain 'push-button," electronically controlled production lines. The more complete automation becomes, the more delicate and complicated the machinery to be maintained in tip-top working condition.

"How much higher engineering education this will require, will, of course, depend upon the specific job, but one thing is certain, the entire level of scientific training for engineering and maintenance personnel must be raised materially.

"So far little has been presented by either our universities or industry in the way of a program for this specialized training. But unless the problem is faced now, we are likely to wake up in a few years with magnificent automatic factories, and nobody prepared to keep them in running condition."

It would appear from the foregoing that it is clearly up to industry, trade associations, and probably government agencies themselves to take immediate cognizance of this important training aspect to insure that not only automation develops fully, but that there will be available an ample supply of trained personnel to maintain proper functioning of automation processes.


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on ethyl acetate or isopropyl acetate, ask your nearest CARBIDE office for the book "Esters" (F-4766). If you want information on all of CARBIDE's solvents and plasticizers useful in lacquers ask for "Solvents" (F-7465). In Canada: Carbide Chemicals Sales Company, Division of Union Carbide Canada Limited, Toronto.

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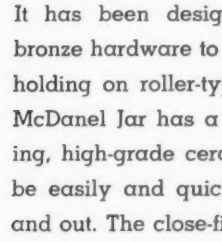


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# VINYLS on the MOVE

a series highlighting the growth of vinyl paints

## The Purpose of VINYLS ON THE MOVE

Keeping abreast of all the developments in a field as new and changing as vinyl paints is no easy task. The purpose of this monthly series is to help you keep as well informed as possible on the technical and marketing aspects of vinyl paints. Please do not hesitate to write should you have questions or comments about formulating or marketing problems.

## NEW VINYL PAINTS BEING READIED FOR SPRING RUSH

With the big-volume spring and summer months not far away, more and more paint processors are completing plans to market new vinyl paints for interiors. Excellent field performance has resulted in increased enthusiasm. Manufacturing costs are fully competitive, and dealers predict the demand will show a marked upswing in 1955.

Principal reasons for this continuing growth are better washability, stronger adhesion on difficult surfaces, and improved flatting and fade resistance. To the manufacturer's advantage is the higher binding power now uniquely possible with National's Resyn 12K-51. Plan for more profits in 1955 by establishing a vinyl paint line of your own in time for the busy months. National's paint chemists are ready to help you make quality paints at highly competitive costs. Contact National's nearest regional office or laboratory.

## INHERENTLY FLEXIBLE VINYL COPOLYMER PROVIDES GREATEST PIGMENT BINDING CAPACITY

### Film Fusion Additives Helpful

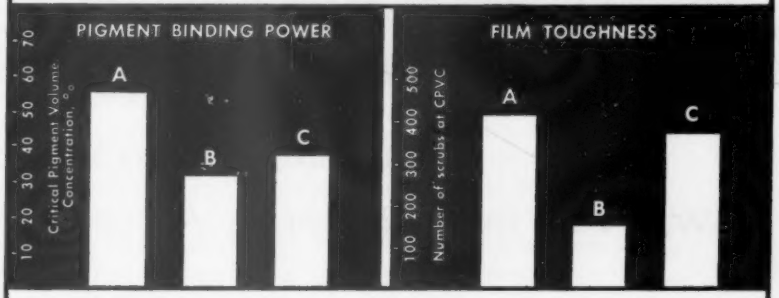
Higher pigment concentrations without sacrificing film toughness and integrity now appear possible in vinyl paints. Completing the first phase of a detailed study, National's researchers report that copolymerization and film fusion additives significantly improve the binding power of resin emulsions—a promising step in the direction of lower raw material costs.

An inherently flexible vinyl copolymer (National's Resyn® 12K-51) and straight PVAc were the resin binders compared in this part of the study. Hexylene glycol, Pycal 94 and methyl carbitol were selected as film additives. Of these, hexylene glycol produced the highest increase in pigment binding power. As shown in the table below, straight PVAc containing no additive gave a CPVC of 32%, with the film failing at 150 scrubs*. An increase of CPVC to 38% and film failure at 380 scrubs resulted when 10% dibutyl phthalate and 7.5% hexylene glycol were added to straight PVAc. On the other hand, Resyn 12K-51 with 7.5% hexylene glycol gave a higher CPVC of 55% and a tough, flexible film failing after 410 scrubs.

Paint makers who wish to test Resyn 12K-51 can do so. Interior formula F-205, a high PVC paint, with excellent performance characteristics, will be sent on request. More data, samples and color information for a complete color line also are available.

*NOTE: In this study, only the actual resin solids are considered in calculating PVC. With postplasticized PVAc emulsions, both resin solids and plasticizer are sometimes considered as binder in calculating PVC—but if this is done, the PVC's of postplasticized straight PVAc's are even lower than indicated above.

**RESULTS AT CRITICAL PIGMENT VOLUME CONCENTRATION**




**A—Inherently Flexible Vinyl Copolymer Emulsion—National's Resyn 12K-51 with 7.5% Hexylene Glycol.**

**B—Straight PV Acetate, no additives.**

**C—Straight PV Acetate with 10% Dibutyl Phthalate and 7.5% Hexylene Glycol.**

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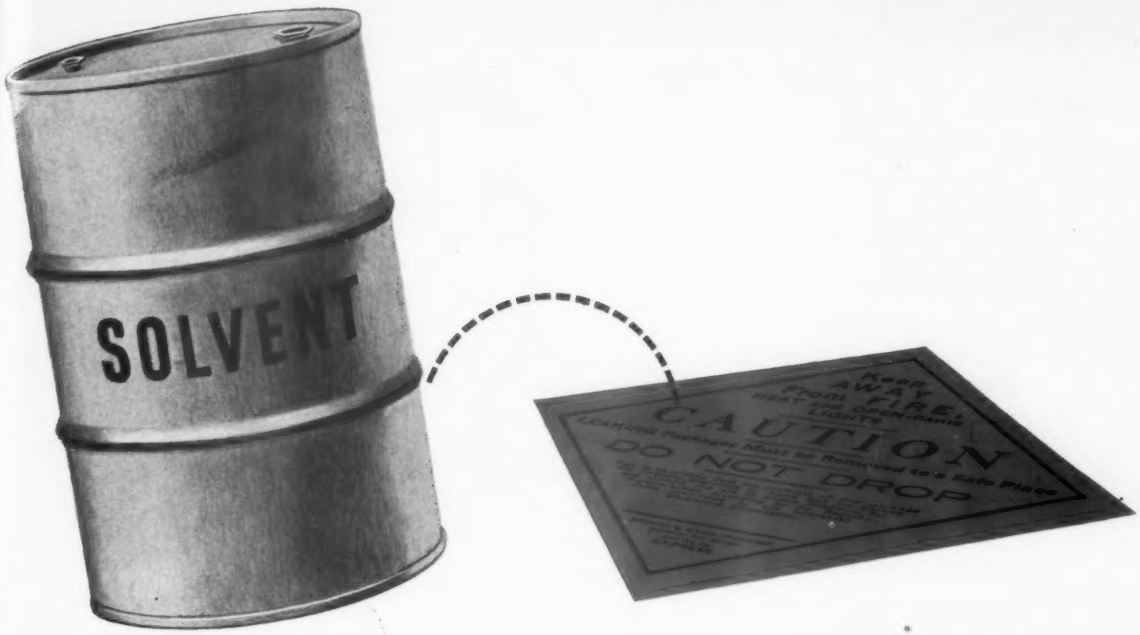


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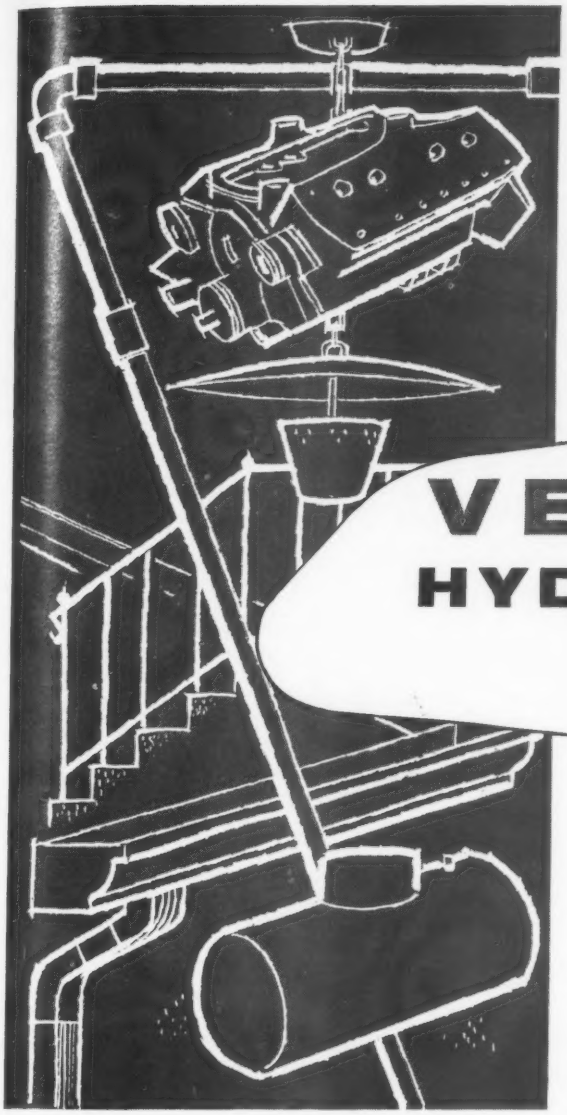

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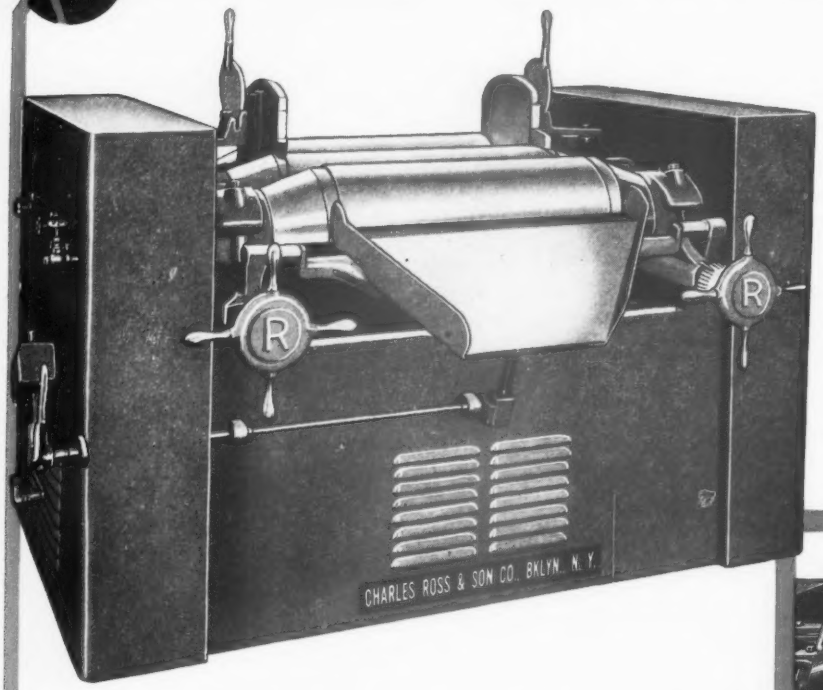


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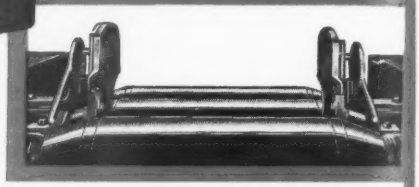

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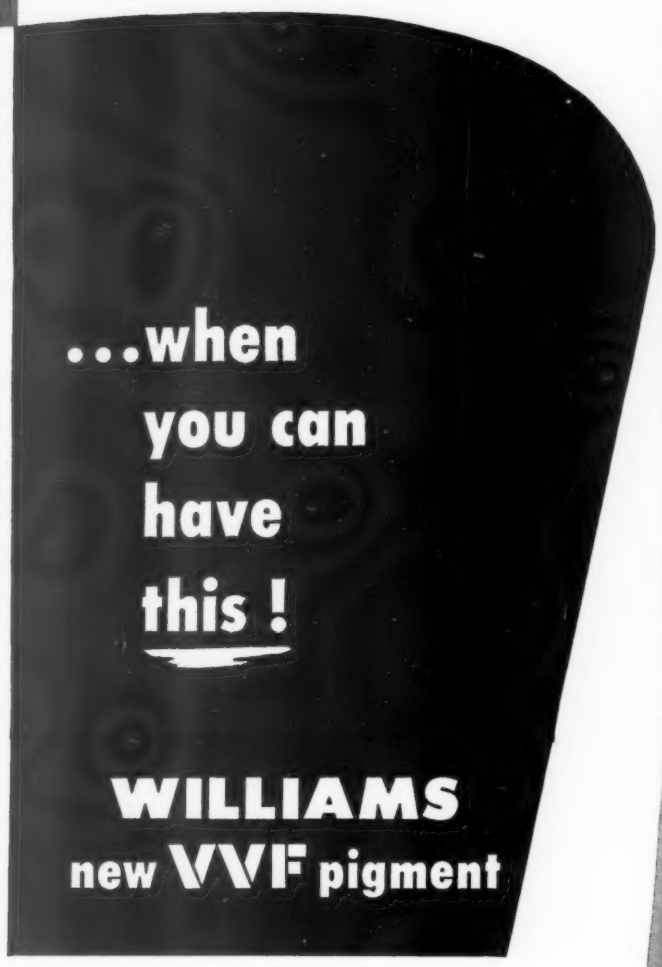


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| 100 | Dispersed Strength | 275 |
| 405 | Hiding Sq. Ft./Lb. | 670 |
| 27 | Gloss % | 60 |
| 75:25 | Grinding Ratio | 75:25 |
| 3.50 | Hegman Fineness | 6.50 |

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| • Mix | |
| • Package | |

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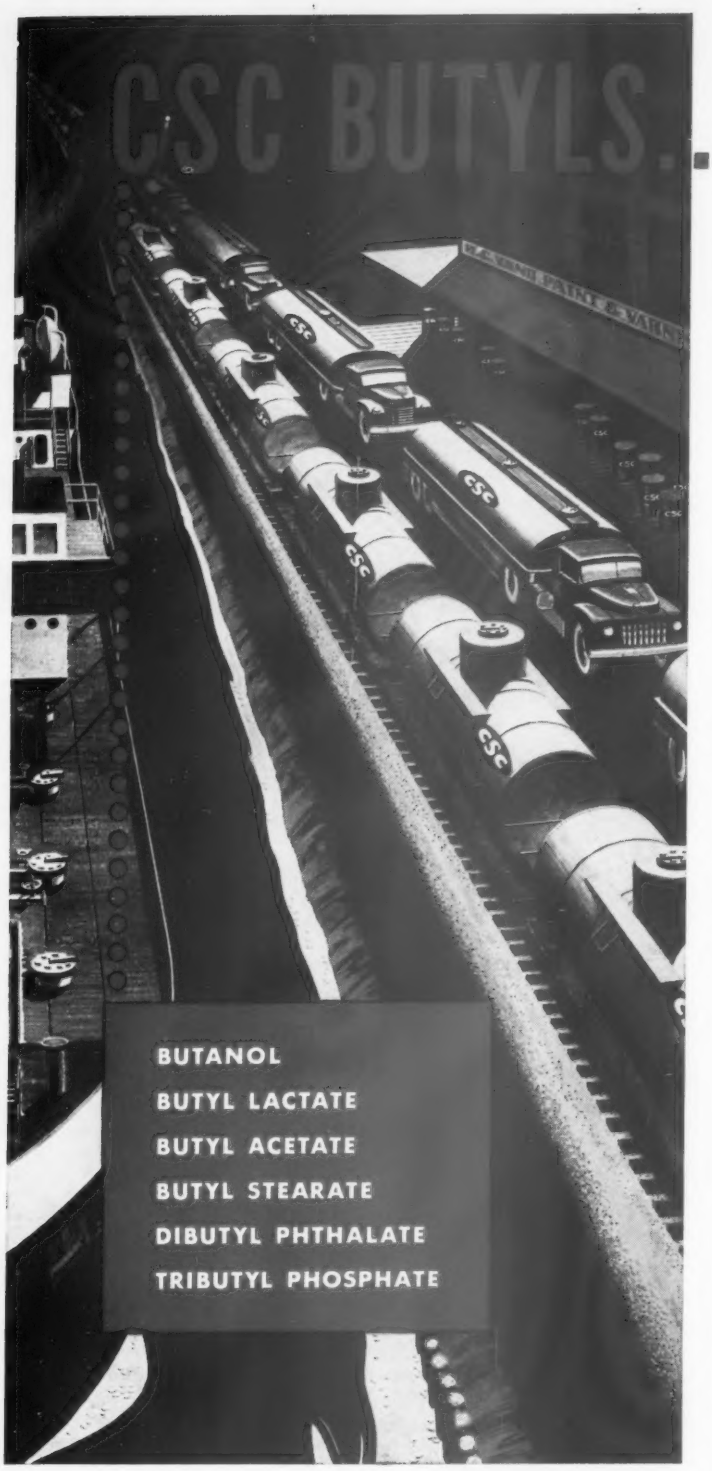


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# PETROLEUM THINNERS FOR THE PAINT INDUSTRY

By
E. P. RITTERSHAUSEN*

THINNERS derived from petroleum are widely used in the paint industry. Since there are many thinners available covering a wide range of properties, the paint formulator is usually able to locate one having characteristics most suitable for his particular application. Although there are many physical and chemical properties of a solvent which influence its performance in a paint, experience has shown that there are several which are of prime importance. The purpose of this paper, therefore, is to enumerate the various important properties of petroleum thinners, and to show the importance of these properties to a paint formulator. Furthermore, an indication of the range of petroleum solvents available to the industry will be given.

## Sources

There are three main sources of petroleum naphthas. The so-called straight run or aliphatic naphthas are derived directly from the desired crude oil by distillation. Usually a broad "naphtha cut" is distilled from the crude, and, by subsequent closer fractionation, the naphthas of desired boiling range are obtained. These fractions are then chemically treated to improve color and odor and to remove ingredients that may cause corrosion or have a tendency to form gummy deposits or residues. After the treating and finishing steps, the products are ready for the market.

Thinners consisting of pure aromatic hydrocarbons or those made up of alkylated aromatics comprise the next broad class. Benzol, toluol and xylol belong in this class, as well as the petroleum naphthas of high solvency characteristics. Aromatic hydrocarbons are generally not major constituents of crude oil. Therefore, this class of solvent is not derived in the same manner as the straight run thinners are. Instead, the petroleum refiner must resort to catalytic processes which crack, rearrange, and cyclize the straight chain aliphatic molecules into ring structures. Also, the saturated ring structures, i.e., naphthenes, may be catalytically dehydrogenated into aromatics. Aromatic naphthas are also produced by using selective solvents to extract these type hydrocarbons from petroleum distillates.

In recent years, a third type of petroleum hydrocarbon has become available to the paint industry. This is the odorless thinner. Chemically, these are isoparafinic hydrocarbons. Whereas the so-called aliphatic thinners consist of straight and branched chain aliphatic hydrocarbons, and varying amounts of naphthenes and aromatics, the odorless thinners consist of all branched chain paraffinic hydrocarbons. This type thinner is not derived directly from the crude oil, but is synthetically produced by a catalytic process known as alkylation. Alkylates are characterized by low-odor intensity and relatively poor solvent power.

## Important Characteristics

Irrespective of the type or source of the petroleum thinner, certain characteristics are of prime importance to the paint formulator.

*Volatility or Evaporation Rate*—Thinners play a unique part in a paint formulation. In many paints, the volatile portion comprises over 50 per cent of the entire product; yet, the thinner does not influence the properties of the laid-down film. Therefore, the importance of the role the solvent plays in thinning the coating to the proper viscosity for application and the drying characteristics of the paint in relation to the thinner are not always fully appreciated.

*Mr. Rittershausen is connected with the Socony-Vacuum Laboratories, Technical Service Dept., Brooklyn, N. Y.

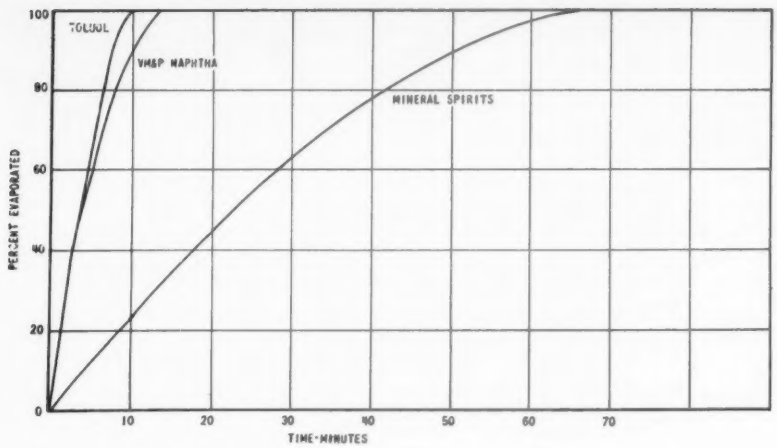



**Figure 1. Evaporation rate curves of several hydrocarbons.**

The rate at which a paint film drys depends largely on the volatility characteristics of the thinner employed. Poor brushing characteristics and lack of wet edge can result from using a solvent that evaporates from the film too rapidly. On the other hand, excessive drying time, sagging, running and thin coats are manifestations of thinners having low volatility. In lacquer systems, blushing, precipitation of the resin and drying time are all influenced by the evaporation of the diluent. It is important, therefore, to have a full understanding of the properties listed which indicate the volatility of a thinner.

The commonly used VM & P Naphthas, Mineral Spirits and retarders are not pure compounds. These thinners are mixtures of hydrocarbons, generally in the proportions found in the crude oil of these fractions. An ASTM distillation shows that the product consists of components having different boiling points. An evaporation rate curve also reflects the fact that these thinners are mixtures of hydrocarbons.

Figure 1 shows the typical evaporation rate curve for VM & P Naphtha and Mineral Spirits. Also included is the curve for toluol, a pure hydrocarbon. Note that the evaporation rate curve for toluol is essentially a straight line, showing the same rate of evaporation during the entire drying period; the other two thinners have curves where the slope becomes less steep towards the end of the evaporating period. This slowing down of evaporation rate is due to the fact that the higher boiling components are being concentrated, and they are evaporating at a slower rate than the more volatile constituents.

Thus, while the distillation range of a solvent indicates the relative volatility of the product, an evaporation rate curve is helpful in indicating how the thinner will perform throughout its evaporation cycle. These evaporation rate data are usually obtained on the neat solvent. What sort of evaporation characteristics will the hydrocarbon have when a resin is dispersed in it?

This question is more difficult to answer. No laboratory method has been developed which satisfactorily shows this characteristic in all cases. Based on some laboratory data, however, one finds that not only does the evaporation increase, but the shape of the evaporation rate curve changes. Figure 2 illustrates this point.

With the aid of the evaporation rate data which the suppliers of thinners have obtained on their products, the paint formulator is able to select a thinner which best suits his needs. If any one product does not fulfill the evaporation rate requirements, blending of two or more of the many available thinners is also possible to meet the desired properties.

*Solvent Power*—As stated earlier, different types of hydrocarbons are present in the petroleum naphthas. The aliphatic or straight chain hydrocarbons are characterized as being poorer solvents than the aromatic or cyclic hydrocarbons. The solvent power characteristics of a particular petroleum solvent depends, therefore, on the type and amount of each hydrocarbon class that is present in it.

There are actually two functions a petroleum thinner plays. One is the dilution of the oils present and the other is the solution or dispersion of the resins in the paint. The first purpose listed is dependent on the viscosity of the thinner, while the second, and more important characteristic, reflects the composition of the thinner.

A highly aromatic thinner will reduce the viscosity of a given resin solution to a greater extent than the same quantity of a less aromatic hydrocarbon. In fact, certain resins are not compatible with the low solvency thinners

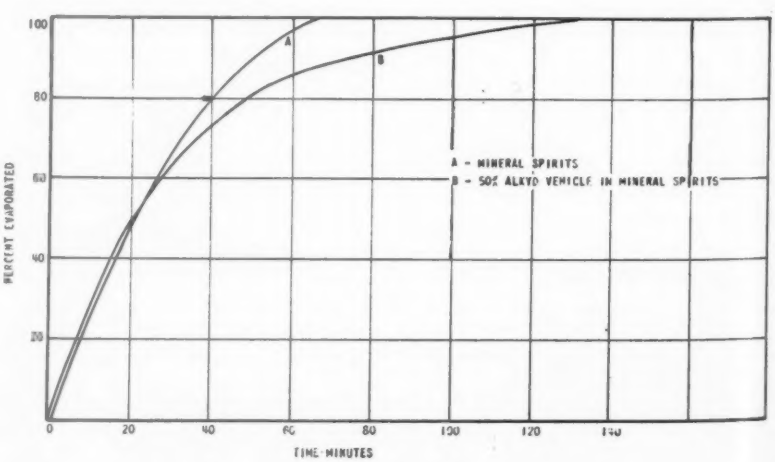



**Figure 2. Effect of solids on evaporation rate.**

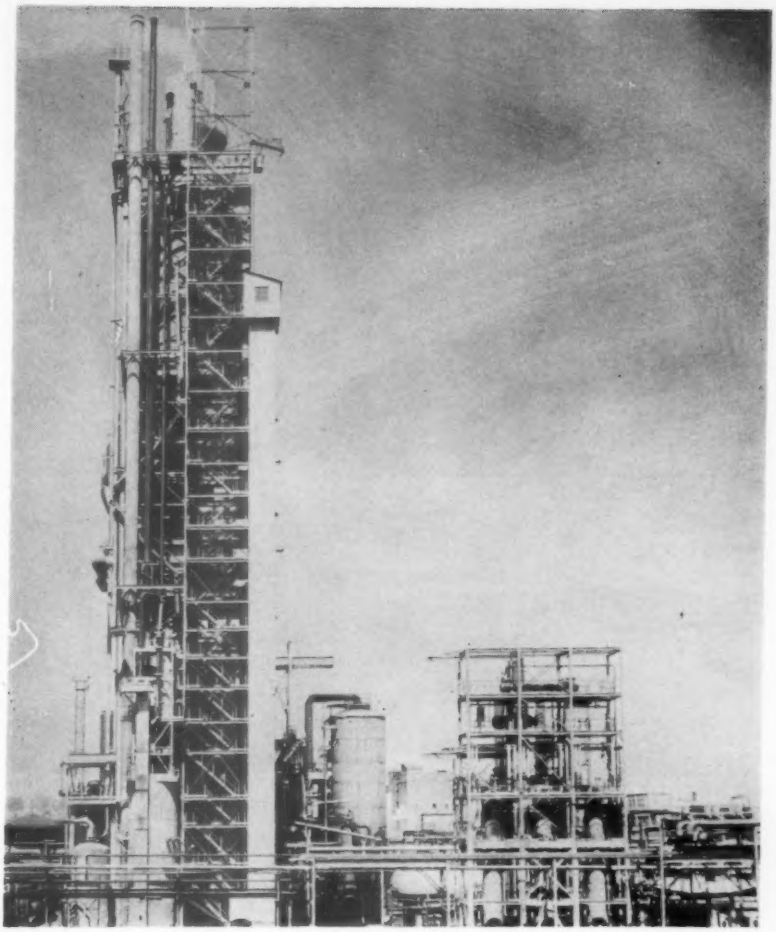
and precipitation of the resin solution occurs when such thinners are employed. Thus, it is essential that the formulator has information available on the relative solvent power of the particular thinner he plans to use.

There are several tests used by the suppliers and the paint and lacquer industries which indicate the solvency of a thinner. A brief description and the significance of these tests follow:

Kauri Butanol Number: This test indicates the tolerance of a solution of Kauri Gum in butyl alcohol to the thinner under test. To a specified amount of the Kauri Butanol solution, the test solvent is added dropwise until the resulting mixture becomes cloudy. The number of cubic centimeters of test solvent required to arrive at the "end point" is taken as the Kauri Butanol Number. The higher the number, the greater the tolerance of the Kauri Butanol solution to the particular thinner under test, hence the greater the solvent power of the naphtha. ASTM Method D 1133-50T gives the details of the test procedure.

While the trends indicated by KB Numbers are meaningful, the paint formulator should be cautioned against attempting to apply the KB data directly to his resin system. The ideal test would be to use both the resin and thinner under consideration to obtain data on the tolerance of the solvent in the solute. The large number of resin systems in use today, however, precludes the possibility of such a scheme being practical.

Aniline Point: This method indicates the temperature at which the hydrocarbon thinner under test and aniline become immiscible. A truer indication of hydrocarbon type is obtained from the aniline point test than by the Kauri Butanol method. A paraffinic hydrocarbon has a high aniline point (in the range of 180°F.), while the aromatic hydrocarbons have aniline points at room temperature or below. To facilitate the testing of aromatic thinners having low aniline points, a mixed aniline point method is used. In this case, the solvent under test is mixed with an equal quantity of a pure hydrocarbon (n-Heptane), having an aniline point of about 140°F. This dilutes the aromatic solvent, and brings the temperature of immiscibility into a more practical range. These methods are described in ASTM Test D 1012-51.



**Thermofor catalytic cracking (T. C. C.) Unit.**

To the petroleum industry, aniline point values are more meaningful than the KB numbers, because the former figure is an indication of the composition of the solvent rather than a measure of its performance characteristics to a specific resin. The aniline point figure can also be of value to the paint formulator for the same reason. It is known that the aromatic hydrocarbons are generally better solvents for resins than the paraffinic ones. The thinners of high solvent power will give greater viscosity reduction for the same solids content. Thus, with the aid of aniline point data, the paint formulator knows the type of thinner required for his system. He also can use data obtained from this test as a means of assuring himself of obtaining a thinner to give the desired characteristics to the final blend.

Butyl Acetate Dilution Ratio:—In the lacquer industry, petroleum fractions are used as diluents for the solutions of resin in the active solvent. A measure of the degree of tolerance a butyl acetate solution of nitrocellulose has for a particular diluent is determined by the Dilution Power Test (ASTM D 1134-53). This again, is a type of performance test and determines the effect of the hydrocarbon on the particular resin system. It is useful to the lacquer formulator in that it brings out the differences between various diluents.

In all the above tests, the indication of solvent power obtained is in a sense an average of all the hydrocarbon types present in the particular thinner. In no prod-

**Conducting a Kauri Butanol determination.**

uct is each chemical hydrocarbon type present in equal amounts, or evenly distributed throughout the boiling range of the thinner. Furthermore, paint and lacquers often contain a mixture of volatile products that have greatly different solvent power characteristics for the resin system used. A paint formulator must be cognizant of this fact, because as the solvent evaporates from a laid-down film, its composition may change. Such changes may lead to precipitation of the resin during drying, especially if the more aromatic portion has greater volatility and leaves the film during the early stages of drying.

**Safety**

*Flash Point*:—Closely related to the volatility characteristics of a petroleum thinner is its flash point. All petroleum products are inflammable. However, the ease with which such a product ignites depends upon the amount of hydrocarbon vapor that is given off at a particular temperature. Thus, a flame or spark will ignite gasoline vapors at room temperature, but the concentration of vapors from a lubricating oil at the same temperature is not sufficiently high to support combustion.

The ASTM Method D 92-52, Flash Point by Tag Closed Tester, describes the procedure used to determine flash points of paint thinners, lacquer diluents and similar materials. By heating the sample in a closed container at a constant rate, and periodically testing the vapor above the liquid with an open flame, the temperature at which the vapors ignite under these conditions is taken as the flash point.

Flash point data are necessary for general safety practices throughout the paint mill, as well as for conforming with shipping regulations. Care should always be exercised in the plant where the vapors of petroleum thinners are present. Proper safeguards should be used on equipment, especially as concerns sparks from electrical equipment and electrostatic discharges.

If the concentration of petroleum vapors in air reach a certain value, this mixture is combustible. More concentrated hydrocarbon mixtures remain combustible in air until a point is reached where insufficient air is available to support combustion. Above this hydrocarbon vapor concentration, the mixture will not burn. The former concentration value is known as the lower explosive limit, while the latter is termed the upper ex-

**Determination of sulfur content of light hydrocarbons by lamp method.**

plosive limit. While these values are different for each petroleum thinner, the approximate range for the thinners and lacquer diluents used in the coating industry are:

| | |
|---|---|
| Lower Explosive Limit | 1.0 Vol. % |
| Upper Explosive Limit | 6.0 Vol. % |

the more volatile the solvent, usually the wider is the range of explosive limits.

*Toxicity*: Caution should be exercised in preventing prolonged breathing of hydrocarbon vapors. While in normal concentrations these are not considered seriously harmful, excessive inhalation of vapors from petroleum naphthas is to be avoided. Adequate ventilation should be maintained in all areas where the odor of hydrocarbons is present.

Prolonged contact with petroleum solvents is also not advisable. These materials are fat solvents. They, therefore, will remove the natural oils and fats from the skin, which may in some cases lead to dermatitis. If it is necessary for a person to be in contact with petroleum thinners for extended periods, either protective clothing or protective skin creams should be used. Where contact is unavoidable, the exposed parts should be washed with mild soap and warm water.

### Odor

The importance of odor in the finished paint and its drying film is well recognized by the paint industry. Evidence of this has been the recent emphasis on odorless indoor paints. These are thinned with a mineral spirit fraction derived from an alkylation process. This fraction is about the ultimate in low odor level of petroleum naphthas. However, it is also desirable for the conventional mineral spirits and other paint thinners to have unobjectionable odors. To insure the user of a thinner that a reasonably low odor and, more important, uniform odor quality is maintained, the refiner treats the "raw" distillates. These treatments may consist of chemically removing the sulfurous materials that may be present in the petroleum fraction, or by removing the odor bodies by means of adsorption on a material having an affinity for such materials.

These treatments not only improve the odor but aid in stabilizing the product against deterioration in storage. Also, the color of petroleum thinners is essentially water-white.

The above characteristics assure the paint formulator that the thinner he uses will be uniform in quality, have satisfactory color and odor, and that its good stability will not detract from the shelf-life of the finished paint.

In Table I are listed some properties of typical thinners used in the paint and lacquer industry. These merely indicate the major types available. Each supplier has a line of products which encompasses these general characteristics, but may have certain specific properties. It is necessary to contact the supplier for information on his particular line of products.

**Determination of API Gravity.**

**TABLE I**
**Typical Petroleum Thinners**

| | Lacquer Diluent | VM&P | Conventional Mineral Spirits | Odorless Mineral Spirits | Retarder |
|---|---|---|---|---|---|
| API Gravity | 57.0 | 58.0 | 50.5 | 55.5 | 42.0 |
| Sp. Gravity 60/60°F. | 0.7507 | 0.7467 | 0.7775 | 0.7567 | 0.8155 |
| Weight, #/Gal. | 6.25 | 6.22 | 6.47 | 6.30 | 6.79 |
| Color, Saybolt | +30 | +30 | +30 | +30 | +30 |
| Flash, TCC, °F. | Below Rm. Temp. | Below Rm. Temp. | 105 | 120 | 145 |
| Aniline Point, °F. | 109 | 131 | 135 | 184 | 139 |
| Kauri Butanol No. | 45 | 38 | 38 | 26 | 34 |
| Distillation, ASTM, °F. | | | | | |
| IBP | 197 | 215 | 308 | 340 | 375 |
| 10% | 204 | 236 | 317 | 352 | 391 |
| 50% | 212 | 250 | 328 | 358 | 412 |
| 90% | 224 | 274 | 348 | 376 | 441 |
| FBP | 255 | 316 | 380 | 401 | 462 |

**Properties of typical thinners used in the paint and lacquer field.**

# GLYCERINE RESIN RESEARCH

By
JOHN D. HIND*

WHAT are alkyds? An alkyd is fundamentally the product of a chemical device for making a substituted polyalcohol which can have as many functions (hydroxyl groups) as is necessary or desirable for good performance as a film former.

An alkyd resin is a mixture of molecules and it will be at its best when all of them are of similar size and linear construction. When there are too many undersize or too many oversize chains, defects in performance as varnish or paint and/or varnish and paint films will become evident.

Why conduct research on glycerine alkyds?

**Why Research on Glycerine Alkyds?**

As much glycerine is used in alkyds and paint products as is used in any two other important outlets.

This market is threatened by other polyols—and to a less controllable extent (from our immediate standpoint) by the position of alkyds in relation to other resins.

We can do our part by research to see that glycerine is not unjustly criticized. We can show up dishonest comparisons. We can show how the excellent qualities of glycerine can best be made evident. This implies finding ways of making the best glycerine resins we can.

If this is done, glycerine will maintain and improve its position among polyols. And we will have done our part in maintaining the position of alkyd resins in relation to other resins.

It is easy to find information in the literature which is not favorable to glycerine. Over the years, glycerine has been the standard against which all new polyalcohols have been evaluated. It has been at the top of the heap, so to speak, and every producer of a competitive product has found it necessary to attack this position.

Thus we find that the technical literature is full of comparisons with other polyols made by persons and organizations each one of which had an axe to grind, —against glycerine. Many of them have not cared particularly how a point was made for his favored product—just so long as it was made. They have left a trail of erroneous ideas and half-truths which are unscientific, and costly in that the total effect probably reduces the demand for glycerine.

There is a second reason for this state of affairs (and it is more excusable). It is not hard to visualize that all of the mistakes which have ever been made in the preparation of alkyd resins have been made first with glycerine-based formulations. Glycerine has absorbed much (unjust) blame for resin defects which should have been with more honesty attributed to poor workmanship, poor judgment, or just plain lack of knowledge and experience.

Over a year ago, there was a widely circulated abstract of a paper which described the use of various amounts of excess polyol in a certain type of alkyd. It said that twice as much excess glycerine was used as was necessary with PE. It neglected to point out that the experiments had been conducted at or above the boiling point of glycerine!

A few months later, the paper was printed in a well known paint magazine—still with the same abstract, but with the notation in parenthesis "probably as the result of glycerol loss." On reading the paper we could not escape the conclusion that this was an extraordinary understatement. It was only obvious after reading three or four pages that glycerine had been equally if not more efficient for acid number reduction than PE. The author said as much (to his credit). But the damage had been done. Most of those who read the abstract will never study the paper. Even under the adverse conditions, the film properties of the glycerine and the PE alkyds matched very well. Much of the data presented supported the perfectly obvious proposition that glycerine

*Mr. Hind is connected with the Miner Laboratories, Chicago, Ill. This paper was presented at the Glycerine Division Meeting of the 28th Annual Convention of Association of American Soap & Glycerine Producers, Inc. held in New York City, N. Y. on Jan. 26-28, 1955.

evaporated rapidly at its boiling point.

**Comparing Esterification Rates**

We are not aware of any conclusive evidence that PE esterfies fatty acids better than glycerine. Opinion on this point is divided and for very good reasons as we shall see. Yet in spite of this PE is widely claimed to esterify fatty acids better. (As far as rosin esterification is concerned, ester gums of lower acid number are prepared with glycerine. There is no controversy on that point.)

When it comes to alkyds, we have observed that cooking time to obtain desired viscosity is related strictly to the functionality of the resin being prepared. When this factor is equalized, various resin compositions tend to be finished in the same times whatever their polyalcohol compositions.

The uncertainties in the published measurements of esterification rates may be better understood when it is remembered that absolutely pure glycerine, any absolutely pure competitive polyalcohols are very difficult to obtain. This brings us to other fundamental and important facts.

**Role of Impurities**

Technical PE contains at least three different polyalcohols. In addition, there are salts present which could be effective esterification catalysts. Glycerine is a distilled product and it does not usually have many inorganic impurities. (When Tech. P. E. is burned it leaves 0.1% of a strongly alkaline ash.)

Experiments with technical grade materials have their useful place for predicting what will happen under processing conditions. But since it is quite likely that the results are controlled by the impurities present, they are a flimsy foundation for arguments supporting supposed effects of chemical constitution. The example of Kienle's classical work is a good one and should be followed more often. He made crystalline glycerol in attempting to have material of the highest purity.

**B-Hydroxyl Group**

$\beta$-Hydroxyl (or a secondary hydroxyl) is on a carbon atom which is attached to two other carbons.)

A most painful and damaging generalization arises when difficulties in esterifications and resin preparations, which may easily arise from a multitude of other causes, are ascribed to the presence in glycerine of a $\beta$-hydroxyl. This is a popular explanation for a number of troubles because it is an obvious and easy one. It is a generalization that can carry a lot of weight because it has a certain finality about it. Those who propose it usually have no further desire to extend their investigations. One erroneous generalization (in this case) can lead to other less convincing ones.

We have in mind, for example the case of an investigation of the relative reaction rates of diglycerol and glycerine with fatty acids. It was found that the reaction rate of diglycerol was somewhat faster. Diglycerol has two $\beta$-hydroxyl groups but this did not prevent the explanation "The $\beta$-Hydroxyls of diglycerol are probably less hindered than the $\beta$-hydroxyl of glycerine." By similar processes of deduction it might be argued that since rosin contains an $\alpha$ methyl group and glycerine contains a $\beta$-hydroxyl group, glycerine and rosin should not react well together—an obviously absurd proposition.

Such deductions often lead to a blank wall as far as incentive for further experiment is concerned. Because they are so often unproductive they should be carefully avoided, but they are being carefully nurtured in current technical literature, sometimes quite innocently, as when one writer echoes the conclusions of another.

We have heard complaints from some who have compared PE and glycerine neglecting:

1. large changes of functionality, equivalent to three or four units of oil lengths
2. serious technical troubles which indicated large glycerine losses. They have such an exaggerated opinion of the importance of $\beta$-hydroxyl effects that they have attempted to devise explanations for differences in performances among predominantly glycerine resins on that basis. This kind of error arises from the propagandizing efforts of those who have carelessly bandied chemical theories to promote their products.

In recent years, because of the synthetic and ion exchange processes, there has been available glycerine with a high degree of freedom from certain organic impurities. These impurities are basic (alkaline) and are capable of neutralizing any strongly acid impurities in reaction mixtures. We have had the interesting experience of investigating troubles which arose directly because of a change to a purer grade of glycerine.

Glycerine of high purity was heated with dehydrated castor oil to a usual alcoholysis temperature, and a violent decomposition of the glycerine ensued. When heated by itself the glycerine sample was perfectly stable. It was known from long experience that no decomposition would ordinarily occur. (OK at 270°C no catalyst 35-40° higher than usual).

Subsequent experiments showed that the highly refined glycerine did not contain enough alkaline organic impurities to counteract an acidic residue which is frequently present in dehydrated castor oil. In this case, these acidic materials were free to initiate a costly decomposition which fortunately was not disastrous. There are usually enough alkaline impurities in ordinary distilled grades of natural glycerine to prevent this sort of thing. This is not the first time we have encountered costly departures from normal processing behavior. There is little doubt that they arise from the presence (or absence as in the above case) of small amounts of impurities which inevitably exist in all types of alkyd ingredients, and whose effects are too often discounted as unimportant.

**Summary**

Continued good demand for glycerine in alkyds is obviously dependent on continued prominence of alkyds among paint resins.

Alkyds have maintained their position quite well in recent years. One reason for this is that they are so very versatile. Competitive resins have complemented them and extended their usefulness more

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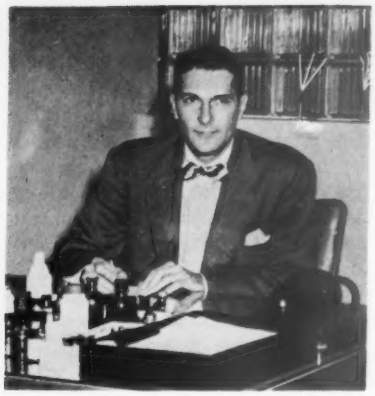

# ODOR CONTROL IN PAINTS

*Consumer Demand For Odorless Paints Stimulating New Interest In Neutralizing Techniques*

By
**Raoul Pantaleoni***

INTO every decision to buy a product or service go many emotional as well as rational factors. For that reason, any unpleasantness or difficulty associated with the product or its use tends to make the buyer defer its purchase, whether he consciously realizes that fact or not.

Deferred purchases mean reduced sales volume, and when the reason for deferment is traceable to some attribute of the product, the problem is a matter of concern to production men as well as to sales management.

Paint odor is such a problem. Apart from whatever negative influence it may have on homeowner purchases, paint odor has other dimensions in the commercial and industrial field which also merit the consideration of paint makers.

For example, it is an established fact that maintenance painting in retail stores definitely results in lost business. In hospitals, painting brings a rise in complaints from patients and is sometimes responsible for complications in a variety of illnesses. In food processing plants, production is interrupted. In factories where paints and lacquers are widely used in finishing processes, there is chronic grumbling from workers and frequent absenteeism blamed, rightly or wrongly, on illness caused by paint odor.

Odor elimination gives the paint manufacturer a cogent sales argument: he can point out to merchants that odorless paint means more than the hopeful "business as usual" during maintenance painting; it means *just as much* business as usual. To industry it means uninterrupted production and increased worker efficiency. In short, abatement of this negative public attitude toward paint not only clears the ground for a better presentation of individual brand values and benefits; it is such a benefit in itself.

The term "paint odor" under which the layman indiscriminately lumps all unpleasant scents arising from all kinds of surface coverings is, of course, too broad for a definitive approach to odor control. Oil paints, latex paints, varnishes, lacquers, all possess distinctly individual odor characteristics, and each is further complicated by variations in ingredients and formulations within its general class. Thus, no single masking agent offers even an approximate solution to more than a very few of the problems encountered.

### Odor Control

Odor neutralization is, in fact, best left to specialists in the field of odor chemistry. This relatively new science has grown in proportion to the rapidly increasing demand for deodorization of products or processes with which noxious odors or fumes are associated. Today it has developed techniques for the analysis and neutralization of odors that go far beyond the one-time practice of merely overpowering a bad odor with perfumes that were sometimes as obnoxious as the vanquished original.

The first step in modern odor control is classification of the offensive smell. It is also a highly important step, for upon its accuracy rests much of the efficacy of the result. Odors—pleasant or unpleasant—fall not only into such broad general classes as fragrant, sour, pungent, fetid, etc., but into many subtle gradations and combinations of these. Effective neutralization depends first upon the identification of these components and then upon the painstaking formulation of a scent that will not merely override them, but rather one that cancels them out.

In oil paints utilizing petroleum solvents, the aromatic bodies in the latter are chiefly responsible for the characteristic "fresh paint" odor. It may be alleviated by the use of non-aromatic solvents, but since the latter are less effective at holding most resins in solution and are therefore often used in combination with petroleum solvents, an objectionable degree of odor frequently remains. Proper masking permits use of the more efficient aromatic solvents by eliminating the undesirable odor feature.

As every user of oil paints knows, the original pungency of fresh paint gives way during drying to a somewhat musty note. This arises from the oxidation of the unsaturates and is more pronounced, of course, where natural

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oils like tung oil are employed. Too, the monomers and additives contained in most synthetic resins tend to oxidize in drying with consequent odor formation.

The latex base paints gained immediate and wide acceptance because the better grades, at least, were odor-free during application. This was possible because the latices were completely stripped of monomer, the odor-causing factor. Stripping adds to cost, however, and the cheaper grades generally employ incompletely stripped latices to which the residual monomer imparts a degree of odor. Masking is less expensive than stripping, and hence offers an economical solution to the odor problem in these formulations.

However, apart from the latex itself, this type of paint is usually characterized by a pronounced unpleasant odor during the drying period. Again oxidation is the culprit, and casein or soya protein, used as thickening agents, are among the substances thus decomposed. Ammonium soap, commonly employed to emulsify the monomer in forming the latex and to increase the stability of the paint, contributes further to the after-painting odors of latex paints.

Lacquers and varnishes confront the odor control technician with still another problem. Here a long list of constituents, among which are cyclohexanone, isophorone, butyl acetate, acetone, toluene, xylene and the ketones, impart to these finishes a unique category of odors which many people find unpleasant or even intolerable.

**Odor evaluation of paint samples. Paint is applied to inside of cartons, closed up and tested at varying intervals by nose.**

Chlorinated rubber paints and penetrating wood finishes present two more general classes of odor, but the point that is doubtless already clear is that no one or even several masking agents can cope effectively with all the main classes of paint odor, to say nothing of their many subdivisions.

Deodorization should be custom tailored to the specific situation it is intended to remedy. If this statement needs further support, one has only to recall that the masking agent, in addition to performing its intended function, must not react in any way with the formulation, and it must not inhibit drying. Thus, the use of phenolic bodies, useful in some other phases of odor control, is ruled out at once because they would retard film formation. Finally, the masking agent must evaporate at the same rate and must possess the same degree of diffusion as the offending odor. In the case of oil base paints, this means that it must contain a volatile component to neutralize the relatively quick-drying solvent and a residual component to cover the slowly oxidizing resin—and each of these components must be dissipated at such a rate that its own odor will vanish with the one it is paired against.

**Odor testing of paint solvents preliminary to application of odor control materials to solvents themselves—one step in the odor treatment of paints.**

### Neutralizing Odors

It may be of interest to trace some of the steps by which the technician goes about neutralizing paint odor. The laboratories of van Ameringen-Haebler, Inc., whose Industrial Division specializes in deodorizing all manner of products, have established for paints twelve basic categories of odor. Samples of the formulation to be treated are screened against these twelve characteristic odors which, though empirical, are precise enough to define the avenue of approach. A study of the formulation and numerous tests supply necessary data on evaporation rates and reveal what materials must be avoided in the masking agent to prevent drying difficulties and related problems.

After a great deal of careful experimentation, there emerges a neutralizing agent that is precisely tailored to offset the complex of odors emanating from the specific formulation at hand. But here it should be emphasized again that

*(Turn to page 78)*

# DRYING OIL TECHNOLOGY

## PART III

### *Methods of Modifying Oils*

REFINERY processed oils held an unchallenged position as the backbone of the paint industry for a long time. Then water-thinned latex paint came along and seized a large "chunk" of oils' major market—interior wall coatings. Vinyl resins and other synthetics further upset the balance of power by making inroads into oils' second largest market—floor covering materials.

Will these upstart raw materials eventually push the traditional refinery processed oils completely off the paint map? That question is in many minds today.

The answer, we think, will not be known for some time. But present indications are that in *this* war for survival, at least, an easy coexistence will be the solution.

Research chemists and engineers threw new miracle raw materials into the fray? Champions of drying oils retaliated with many chemically and physically treated oils that are now proving vital to certain modern surface coatings.

Few of these improved oils and derivatives can be considered true synthetics. Most fall into two main groups:

1. Those produced by chemical changes.
2. Those—known as processed oils—produced chiefly by physical treatment.

It is the second group—the processed oils—that concerns us in this installment. In connection with these oils we will discuss the following processes:

1. Fractionation of fatty acids
2. Molecular distillation of oils at high vacuum
3. Solvent extractions and segregations
4. Removal of antioxidants
5. Catalyzed modifications
6. Ester interchange

**Fractionation of Fatty Acids**

Fractionation is an important process in the improvement of drying oils. There are several types of fractionation.

Fractionation of mixed fatty acids produces segregated acids with varying degrees of unsaturation. The more unsaturated acids are then reesterified, modified in alkyds, or converted to the epoxy-type varnishes. The fatty acids are separated from their natural oils by autoclave, continuous splitting through hydrolysis at high temperatures, or by the older atmospheric Twitchell process.

The acids thus obtained are purified by a fractionation process such as distillation. Fractional distillation produces fairly pure cuts of fatty acids when an appreciable molecular weight difference exists, as for example, in fish oils, where highly unsaturated acids of C-20, C-22, and C-24 chains are known.

Commercial installations often conduct separations by means of fractional crystallization. Sometimes one of the several useful solvent extraction processes is used.

In the Emersol process free fatty acids are fractionally crystallized from their solution at low temperature. The Pittsburgh Plate Glass process involves a selective extraction with furfural whereas the Solexol process utilizes liquid propane as the extractant. For labora-

This series of articles is being prepared by the Editorial Staff of Paint and Varnish Production.

tory scale separations the chromatographic methods have no peer.

A new separation process, extractive crystallization, has been gaining in popularity recently. Extractive crystallization makes it possible, with urea, to separate fatty acids solely on the basis of their degree of unsaturation. The urea forms crystalline addition complexes with straight chain organic compounds. The more saturated fractions are removed from the more unsaturated fractions.

With increasing unsaturation, the fatty acids impart properties varying from pure plasticizing action to extreme drying.

Of course it is true that the use of pure fractionated acids is severely limited by excessive cost. But fatty acids derived from whole oils are readily available at competitive prices. Segregated whole fatty acids in which some undesirable fraction has been removed, i.e., saturated acids removed by solvent extraction, are also available.

**Distillation of Oils—High Vacuum**

Although to date the process known as molecular distillation of oils at high vacuum has had almost no use in the paint industry, it has proved quite valuable in the pharmaceutical and food industries. The time may come when paint people will be using it too.

This method requires that the oils be heated at extremely low pressures, i.e., 0.001 mm. mercury, and that the heating and distilling surfaces be quite close to each other —perhaps a separation of only one centimeter. Obviously this treatment is not very practical for large scale separations. Not only is it expensive because of the high vacuums required, but the yields are low. Furthermore the random distribution of the various fatty acids in glyceride molecules prevents clear cut fractionation.

From a production man's point of view, the rate of distillation is extremely slow. For example, a 1,000 gallon batch may distill at the rate of only 7-8 gallons per hour. On the other hand, this is not as disadvantageous as one might think, because the unsaponifiable and free fatty acids are more volatile under the conditions of molecular distillation and therefore much of the odor bodies, color bodies, and natural inhibitors of oxidation can be eliminated.

**Solvent Extractions**

Another way of separating whole oils into fractions of differing unsaturation is by using the methods described above under the heading "Fractionation of Fatty Acids." Naturally the separation of oils cannot be as clean cut nor as efficient as the fatty acid separation, but in some cases it upgrades oil sufficiently for limited uses.

**Removal of Antioxidants**

Unprocessed drying oils contain natural antioxidants which retard the normal oxidation process of drying compositions. The time of apparent inactivity is known as the induction period. Pure materials have no induction period. Among the probable antioxidants of linseed oil are chlorophyll, xanthophyll, carotene, and the phosphatide, cephalin.

The "break" of an oil is closely related to its natural antioxidants while drying time is closely related to an oil's "break" and phosphatide content. Only when substances of this type have been removed do drying times become uniform. Natural antioxidants are removed by boiling, extraction, and by treatment with strong oxidants such as benzoyl peroxide.

**Catalyzed Modifications**

Catalyzed oils are oils to which a catalyst has been added. This reduces the time required to obtain a given viscosity when the oil is heat-bodied. Of course, the catalyst must not detract from the other properties of the oil, such as rate of dry, color, resistance, or grinding properties.

Among the organic catalysts in use are β-methyl anthraquinene, diphenol carboxyl anthracene, or thioβ-naphthol.

In general, catalyzed oils heat body in 20-70% of the time required for the uncatalyzed oils, depending upon the quantities of catalyst used. This may vary between 0.1 and 0.2%. At elevated temperatures a shorter period is required and the resulting products have better color and lower acid values.

Experts believe that the catalyst accelerates the isomerization from non-conjugated to conjugated unsaturation. (There will be more about this in a later chapter.)

**Ester Interchange**

By ester interchange it is possible to upgrade a softer oil by blending with a harder oil. To a certain extent the result is an averaging of the properties.

As a rule, if two oils of widely differing reactivity—such as tung oil and soyabean oil—are heat bodied together, the more reactive oil will gel while the other will remain limpid. Such oils can, of course, be cooked together under certain conditions.

For example, the oils may be held with agitation for an hour or so at 225°C. in the presence of a suitable catalyst such as lime. This is possible because an exchange of fatty acid radicals takes place between the various triglycerides present, resulting in a more homogeneous product.

A typical ester interchange reaction is shown in Figure 1.

Next month we will review the more recent aspects of drying oil chemistry and discuss the various drying oil products obtained by chemical reactions.

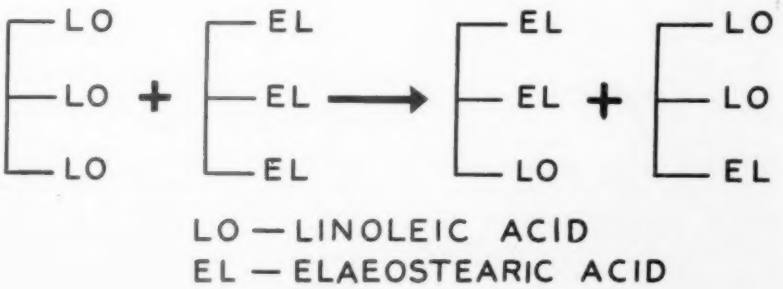


**Figure 1. Typical ester interchange reaction.**

# COLD CHECK TEST AND PERFORMANCE OF FURNITURE LACQUERS

By M. F. KOOISTRA
N. V. SIKKENS

After an introduction on the properties of furniture lacquers the origin and the fundamental principles of the cold check test are discussed. A theory on the mechanism of the formation of cracks in wood lacquers is developed, and its agreement with the results of practical cold check tests is demonstrated. The influence of different variables such as film thickness and kind of wood has been investigated. Finally the practical value of the cold check test is fully discussed.

BEFORE starting any discussion on some laboratory test method of wood lacquers, it will seem correct to determine first the properties which such a wood lacquer should have with respect to a satisfying performance in practice. The aesthetic function of modern furniture lacquers, although very important in finishing living- and bedroom furniture, piano's, radio- and television- cabinets, is the least interesting as long as physical testing is in question. As a consequence of man's impredictable taste, aesthetics cannot be measured by any laboratory method. —Other mechanical functions of wood lacquers, such as hardness, adhesion, flexibility, scratch-resistance, moisture-impermeability, burnishing qualities, recoatability, are all more or less easily accessible to laboratory test methods.

Hardness, adhesion and flexibility may be investigated simply by any knife test. Hardness may also more exactly be measured by ingenious instruments such as the Sward Rocker or the "T.N.O.-hardness-meter". Impermeability, burnishing properties and recoatability may also be determined by simple practical tests of short duration. These kinds of tests do give reliable informations on the performance of wood lacquers. It has to be born in mind however, that tests on wood lacquers will only give dependable results, when they are carried out with the lacquers applied to wood. It is because of the anisotropic and porous structure of wood, that the adhesion, and therefore also the apparent flexibility of lacquers applied to wood are of a fundamentally different character, when the same lacquer has been applied to metal or glass, or when free films of the same lacquers are investigated.

The most important function of any lacquer is its durability. In other words: its good qualities should last as long as possible. A good furniture lacquer should preferably outlast the piece of furniture coated with it. It is this durability that is the most difficult to investigate under laboratory conditions, because laboratory tests should give quick results, whilst durability tests necessarily include the factor "time".

The durability of nitrocellulose wood lacquers has often been determined by some kind of artificial ageing, mostly by simply storing coated test panels for some time at elevated temperatures. Under these conditions it is in fact the volatility of the plasticizer, which mainly comes into account, at least when not too high a temperature is applied. The resulting loss in flexibility, when the plasticizer disappears by evaporation, gives some account of the increasing brittleness of nitrocellulose lacquer films. This brittleness is undoubtedly closely allied to the cracks, which may appear in nitrocellulose wood lacquers sooner or later. A closer inspection of these cracks however shows us, that apart from the loss of plasticizer another factor must be involved. Very often these cracks are distinctly running into one direction, mostly, but not necessarily, parallel to the grain. The only plausible explanation of this phenomenon is found in the anisotropic expansion of the wood. This anisotropy is considerable; the linear expansion coefficient of different kinds of wood in a direction, parallel to the grain, varies from $3\text{-}9\times10^{-6}$; in a direction across the grain this coefficient

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of expansion is of the order of 40-60$\times 10^{-6}$. To give some reasonable basis to durability-tests of wood lacquers this anisotropic expansion should be taken into account.

### Cold Check Test

From these considerations the cold check test resulted. This cold check test consists essentially of a periodical change of temperature, to which the coated test panels are subjected. The test panels are kept alternately for some time (e.g. one hour) at a higher, and for one hour at a lower temperature. The number of cycles (one cycle includes one period at the higher and one period at the lower temperature), after which the lacquer under investigation starts cracking, gives a standard for the performance in practice of the lacquer in question.

In American literature very often a cold check test is described, which operates with higher and lower temperatures of + 50° C and —20° C respectively. We prefer working with temperature changes between 50 or 60° C and 0° C. This lower temperature of 0° C was chosen on account of the consideration, that this temperature seldom will be exceeded downwards in furniture-practice. At application of a lower temperature of —20° C a new complicating element is introduced, viz. the low-temperature brittleness, a property belonging to most plasticizers.

In studying the cold check test we had to establish the fact, that cracking always occurs during the cold period, at 0° C. Therefore. To make correlation with practice justified, a temperature not below 0° C should be maintained. We think it definitely incorrect to employ a lower temperature which lies substantially below the lowest temperature occurring in furniture practice.

### Mechanism of Crack Formation

In investigating the practical value of the cold check test, it appeared that one should distinctly differentiate between good and bad wood lacquers. In this connection "bad" lacquers should be understood as lacquers with very low flexibility, the way it occurs e.g. with nitrocellulose lacquers based on ester gum, in which the ratio of ester gum to nitrocellulose exceeds the value 3:1.

It becomes immediately clear that this differentiation should be made, when we look more closely at the mechanism of the formation of cracks in wood lacquers. First of all it is stated that a low flexibility mostly involves a low thermal expansion, while a good flexibility implicates a higher thermal expansion. By the way, it would be interesting to measure the coefficient of thermal expansion of this kind of lacquers, because the following theory is very closely related to its value.

A lacquer with bad flexibility will not be able to keep pace with the expansion and contraction of a material with a higher coefficient of expansion (wood, but also metal or glass). The anisotropic structure of wood has no influence in this special case, because the coefficient of expansion of the lacquer is of a quite different order, i.c. much smaller. Because of the expansion, which the wood undergoes during the cold check test, the lacquer soon will crack, and these cracks will show no prevailing direction, they will be completely disorientated. Analogous results will be obtained when the same lacquer of low flexibility is tested on metal or glass.

Our investigations found this hypothesis to be completely correct. Lacquers of low flexibility, which did crack already after 5, 10 or perhaps 20 cold check cycles as described before, did give cracks without any prevailing direction, and on steel the same lacquers gave completely identical results.

With lacquers with a better flexibility, of which the coefficient of thermal expansion is of the same order as is the average expansion coefficient of wood, the mechanism of the formation of cracks must be of a somewhat different character. Here the anisotropy of the expansion of wood plays a definite part. The expansion in the direction across the grain is many times larger than the one parallel to the grain, whereas the expansion of the lacquer film, applied to the wood, will approximately try to be isotropic. In consequence, the wood and the lacquer film will exert on each other different forces in different directions. This will cause stresses that will have their maximum value in one definite direction. A lacquer with a not extraordinary high flexibility will not be able to stand those fluctuating stresses for more than some limited period of time. Sooner or later some kind of fatigue will result, and the lacquer shall start cracking in a direction perpendicular to the direction of the maximum stress.

From numerous cold check tests with ordinary nitrocellulose wood lacquers, these cracks appeared nearly always to be directed parallel to the grain. This result iindicates that the stresses between lacquer and wood have been a maximum in the direction, perpendicular to the grain, and this leads to the conclusion, that the coefficient of thermal expansion of such lacquers must be of the same order as the one of wood parallel to the grain.

Furthermore it is in close agreement with this theory that this group of lacquers, when subjected to a cold check test on a steel support, remain considerably longer unimpaired than when tested on wood. Steel expands isotropically, and its coefficient of thermal expansion is about $10\times 10^{-6}$, that is of the same order as the one of wood parallel to the grain, and therefore as the one of the lacquer film.

From this observation it may appear that a cold check test when performed on another support than wood (in the literature one finds sometimes indeed described some cold check test on a steel or glass support) is meaningless, unless its only purpose is a first differentiation between lacquers with very bad flexibility and lacquers with moderate or good flexibility. For lacquers of good flexibility the cold check test on steel or glass is an absurdity because in these cases the anisotropic expansion of the wood plays an essential part. To investigate the influence of different circumstances on the course of the cold check test we started with a series of nitrocellulose lacquers with an increasing percentage of ester gum; the amount of plasticizer (dibutyl phthalate) was kept constant. We stated already that a differentiation appears necessary between lacquers that crack easily, and

lacquers with a good cold check performance.

**Film Thickness**

The influence of film thickness appeared to be very important With lacquers of bad flexibility, which give disorderly cracks after a small number of cold check cycles, these cracks appear sooner the smaller the film thickness. With good lacquers, cracking only after a much larger number of cycles, and in one definite direction, this cracking appears first with greater film thickness. The symptoms of fatigue mentioned before apparently show sooner in this case with thicker films. Our experiments showed more than once, that lacquers having a definitely different cold check resistance in equal film thicknesses, showed an apparently similar behaviour when the better lacquer was applied in a heavier coat. Exaggerating this difference in film thickness, it appeared possible to obtain better cold check test results with lacquers of a lower permanent flexibility, the cracking of the lacquer with the higher permanent flexibility being promoted by a greater film thickness.

From these phenomena we arrive at the conclusion, that in a competitive cold check test the lacquers under examination necessarily shall be applied in equal film thicknesses. As a yet more important conclusion it should be stated, that a reliable correlation with the practical performance of a furniture lacquer only will be obtained, when the cold check test is performed with test panels on which the lacquers in question have been applied in exactly the same way as they will be in later practice.

**Kind of Wood**

The influence of different kinds of wood appeared to be less clear. We did obtain different cold check test results with the same furniture lacquer applied to different kinds of wood (mahogany, oak, walnut, birch, beech), but these differences were not very large. A correlation with the anisotropic thermal expansion of these kinds of wood can only be obtained by considering the relative differences in expansion respectively parallel to and across the grain as a starting-point. In doing so, it appears indeed that cold check resistance is best when this relative anisotropy is smallest. This relative anisotropy has to be defined as the ratio between the coefficients of expansion respectively parallel to and across the grain. This result is given however under some reservation. It is, however, in close agreement with the theory developed before concerning the mechanism of the formation of cracks on anisotropic materials.

In conclusion it should be recommended to investigate the cold check resistance of furniture lacquers on the same kinds of wood, that will be used in practice.

**Scratch Resistance**

A lucky relation appears to exist between cold check resistance and scratch resistance. In this connection scratch resistance should be understood to be the resistance against a more or less rough injury, e.g. with a sharp metal object. This scratch resistance appears in practice to be a maximum, when the lacquer shows a very good permanent flexibility next to good hardness and adhesion. This good flexibility seems to be necessary in order to be able to absorb the shock, the dynamic energy of the injuring object by means of elastic deformation, without mechanical damage. We have seen already, that a good permanent flexibility is the first requirement for a good cold check resistance. And conversely it seems obvious, that from a very good cold check resistance a good permanent flexibility may be deduced. We found this repeatedly to be quite true. When this good flexibility combines with a good adhesion, very surely a good scratch resistance is involved. In this way one is able indeed, to conclude in a rather simple way a well-founded prediction about scratch-resistance later on, from the cold check test results. It has been observed already, that the adhesion on wood of the lacquer in question never should be neglected.

**Value of Cold Check Test**

It may have appeared from the foregoing, that the value that can be ascribed to a cold check test, depends strongly on the way it is performed. In the first place it is necessary to apply the lacquers under investigation on test panels of the same kind of wood as will be used in practice. In the second place, and this is much more important, in a competitive test the film thickness of the lacquers under examination should be equal: in an absolute test this film thickness should correspond with the film thickness which is to be applied in practice. Thirdly one should definitely account for the temperature limits that shall be used.

The importance of the cold check test consists in predicting the practical performance of furniture lacquers. It is hardly possible to indicate a definite value for the number of cold check cycles that any furniture lacquer should stand without cracking, in order to show a satisfying durability in practice. Different types of lacquers behave differently in this respect, and the influence of film thickness alone makes fixation of a definite standard already impossible. Communications relating to this matter, that can be found in advertisement literature, are quite meaningless, unless some standard type of lacquer is included. It is necessary to form an idea about the cold check test behaviour of different types of lacquers, simply by experience. In this respect, lacquers that have already demonstrated their reliability in practice, should be taken as a starting-point.

We arrive automatically at the most important function of the cold check test for the lacquer technologist: the differentiation of a series of test lacquers. For a first, rather rough division we have seen that a test on metal or glass is already sufficient. Very bad lacquers are very soon discovered this way. For a definite judgment of a series of furniture lacquers it is necessary to perform a cold check test on the right kind of wood, with the correct film thickness. Preferably one or more standard lacquers with a known practical performance should be included in the test. In doing so, a reliable judgment on the utility of a furniture lacquer is obtained.

# News of Paint and Varnish Production Club Meetings

John W. Vanderhoff giving illustrated talk at monthly meeting of New York Production Club.

## NEW YORK

The monthly meeting of the New York Paint and Varnish Production Club was held Feb. 3rd at the Brass Rail Restaurant, 100 Park Ave., New York City. The feature of the evening was a talk, illustrated with motion pictures, on "Fundamental Properties of Polymer Latexes" by Dr. John W. Vanderhoff of the Dow Chemical Co.

The following men were elected to membership at this meeting:

Class A: Bernard R. Hale, A. C. Horn; K. N. Sahaya, M. J. Merkin Paint Co.; D. H. Harper, Kienle and Co.; G. J. Meyers, Pettit Paint Co. Inc.; W. A. Iobst, Solar Compounds Corp.; V. G. Santulli, Hotopp Paint and Varnish; J. X. Morales, M. J. Merkin Paint Co.; Sidney Lauren, Johns-Manville Corp.; P. Pangaro, The Vorac Co.; R. W. Geiss, The Vorac Co.; R. Oppenheim, Spraylat Corp.; A. B. Coopersmith, Breinig Brothers.

Class B: W. A. Steinmetz, Shell Chemical Corp.; E. P. Ritterhausen, Socony Vac. Labs.; C. W. Klein, American Min. Spirits Co.; H. J. Stalzer, National Lead Co.; K. S. Wade, Binney and Smith Co.; A. J. Raffalovich, Signal Corps. Engineers; L. M. Towsley, Bell Telephone Labs.; R. D. Ullrich, Hercules Powder Co.; W. J. Stewart, Nuodex Prod. Co., Inc.; G. W. Waters, Shell Oil Co.; A. E. Kromer, Archer-Daniels-Midland Co.; S. J. O'Brien, American Cyanamid Co.; R. J. Delack, National Starch Prod., Inc.; M. Coffino, D. H. Litter Co.; W. M. Sullivan, Bakelite Co.; Sidney B. Beddow, Enjay Labs. Stand. Oil Dev. Co.

Dr. Vanderhoff's work has been concerned with the mechanism, kinetics, and techniques of emulsion polymerization. Dow's Physical Research Laboraties have prepared uniform particle-diameter polymer latexes, in the range 0.1 to 1.2 microns, by carefully controlled emulsion polymerization reactions. The particle diameters of these latexes have been determined by (a) electron microscopy; (b) turbidity measurements of dilute latexes (c) dissymmetry of light scattering of dilute latexes; (d) diffraction angle of dried crystallites; and (e) light scattering from individual dried particles. Particle diameter measurements on the same latex using the various methods are in good agreement.

Latexes with particle-diameters above 0.5 microns may be resolved in the light microscope and their colloidal characteristics have been observed. Motion pictures taken through the microscope were shown by Dr. Vanderhoff illustrating the following phenomena: (1) Brownian movement of the latex particles; (2) convection currents in a drop of drying latex; (3) the packing of latex particles into a crystalline array at the edge of a drying drop; (4) spontaneous crystallization of latex particles; and (5) "special" or novel effects.

**APRIL MEETING**

**The April meeting of the New York Paint and Varnish Production Club will be held on Thursday, April 14, 1955, at the Brass Rail Restaurant, 100 Park Ave., New York City.**

## NEW ENGLAND

President Newell P. Beckwith, President-Elect Clyde Smith, Treasurer Milton A. Glaser, and Executive Secretary C. Homer Flynn visited the New England Club for the annual Federation night meeting held at the University Club on Jan. 20,

The important contributions of this club to various Federation committees were outlined by President Beckwith. In addition, he cited the importance of increased interest by the club council representatives in Federation affairs.

President-Elect Smith extended an invitation to club officers to meet with him at the Annual Meeting in New York in October, along with other club officers, in preparation for his term of office.

The intention of the Federation to render financial assistance to any member club needing it was expressed by Treasurer Glaser.

Secretary Flynn spoke of the Paint Industry Show and said that it is one of the outstanding industrial shows conducted annually. He further stated that the Official Digest has become one of the top technical journals of its kind today.

Bob Andrews outlined an advanced course in Paint Technology beginning at Northeastern University, Evening School, in September.

Frank C. Atwood was unanimously elected an honorary member of the Federation by the Class A members present. Mr. Atwood was the originator of the Paint Industry Show, is a past President of the Federation, and a contributor of considerable time and effort to both the Federation and the New England Club.

The meeting ended enjoyably with a showing of color stereo pictures of Hawaii by Vice-President Alan R. Lukens.

## KANSAS CITY

The February meeting of the Kansas City Paint and Varnish Production Club was changed from February 10, to 11, in order to accomodate a large group of visiting dignitaries from the Federation of Paint and Varnish Production Clubs including President Beckwith. The meeting was held at the Town House Hotel in Kansas City, Kansas.

The Du Pont Co. presented a paper illustrated with colored slides covering the topic "Colored House Paints."

## C.D.I.C.

The 346th Meeting of the C.D.I.C. Club was held at Desert Inn, Columbus, Ohio, Jan. 12, with 61 members and guests present

President Robert Lipp called the meeting to order. The Secretary's report was read and approved. Chet Olsen, giving the Treasurer's report, said there was a balance of $80.86. The report was accepted as read.

Elmer Moerschel, Chairman of the Membership Committee, gave the first reading on two Class A membership applications: William R. Lake, Research Chemist, Robert W. Scott, Formulation Chemist, both of Hanna Paint Co.

The second reading was given two Class A membership applications: Frank J. Bolle, Asst. to Technical Director Pittsburgh Plate Glass Co., and Paul N. Valarius, Research & Development Chemist, Clopay Corp. They were accepted for membership.

The Technical Committee report was given by Robert W. Rosensteel, who said that several meetings had been held, and progress was well under way on several phases of Polyvinyl Acetate Emulsion Paint Studies. He stated further that Robert Schwartz, Marvin Coulter, Lew Larson, Bill Kentner, Chet Olsen, and others have been instrumental in getting it off to a good start.

William Kentner asked that the Club advance some money for needed supplies and equipment for Club paper. It was moved and seconded that up to $150.00 be advanced for such needs. Motion carried.

The meeting was then turned over to the Program Chairman—Vice President William L. Foy. He introduced the speaker of the evening, Frank King, Jr., Godfrey Cabot, Inc., who talked on "Some of the Newer Applications & Developments of Wollastonite—A New Extender Pigment." Mr. King pointed out that this paper was scheduled to appear in the Jan. issue of Official Digest, and for this reason would hit only on recent developments, applications, etc. A movie, "Industrial Production of Carbon Black," was narrated by Frank Peabody, also of Godfrey Cabot, Inc.

## CHICAGO

The February meeting was held at the Furniture Club. Dr. M. C. Londergan, E. I. du Pont de Nemours and Co., spoke on, "Trends in the Formulation of Dark Color House Paints."

Dr. Londergan discussed the problem of formulating deep colors for exterior house painting and the findings of the du Pont Pigment Div. in their testing program. Dr. E. C. Botti of the Color Div. assisted in the discussion.

## PACIFIC NORTHWEST

The 1955 symposium will be held May 13-14 at the Gaffney's Lake Wilderness Resort just outside of Seattle.

There are accommodations for lodge facilities for the meetings on Friday and Saturday. There will be dinner dancing on Saturday night as the finale.

## LOS ANGELES

The regular meeting was held at Scully's Restaurant attended by 151 members and guests. President Vern Barrett entertained a motion to eliminate reading the minutes of the last meeting. The motion was seconded and approved by the membership.

Les Houy, Chairman of the Good Fellowship Committee, reported on the passing of Andy Snell, Technical Representative of Amsco, during the Federation Convention in November. His passing was a loss to the Los Angeles Club since he was liked and respected by all.

President Barrett informed the membership of the award which had been won in the name of the Los Angeles Club by Dick Campbell at the Federation Convention in Chicago. The Los Angeles Club, through his efforts had been awarded the second place prize for the presentation of the technical paper, "The Calibration of the Sward Rocker Hardness Tester."

A letter, from Federation Headquarters concerning the proposed boundary changes for the Los Angeles Club, stated that those clubs most likely to be affected by the proposed changes had been canvassed, and insofar as there were no objections to these changes, the matter would then be presented to the Federation Council.

George Venatta, Club Council Representative, reported on his attendance at the Federation Annual Meeting. He stated that as an alternate to the amendment which would increase the number of members-at-large on the Board of Directors from six to nine members (published in the Official Digest of July 1953), the Constituent Club Council Representatives had drafted a new set of amendments which specified that the three additional men should be selected from the Constituent Club Council Representatives. This amendment was accepted and presented for first reading at the Federation Annual Meeting. Further action will be taken at the Spring Council Meeting, and it is hoped that approval may be obtained at the Annual Meeting in 1955. A copy of this proposed amendment to the By-laws will be found in the December 1954 Official Digest. Mr. Venatta also stated that money from the Federation Educational Fund is available for approved educational or technical projects.

Bob Vignolo, Chairman of the Membership Committee, read the names of the following applicants for membership:

Class A: Henry S. Cole, Bradley Paint Co.; Clement Einbecker, Hart and Burns Co.; Conrad C. Fimbres, The Synkoloid Paint Co.; Robert E. Garrow, Rinshed-Mason Co.; Donald G. Higgins, Paramount Paint and Lacquer Co.; Robert F. Koperek, Mathews-Oakly Paint Co.; Daniel Mui and Frank Nicholas, Gelvatex Coating Corp.; Robert A. Olson, Mathews Paint Co.; Leland Ray Partridge and John F. Willis, Andrew Brown Co.

Class B: Arnold P. Howe, Leffingwell Chemical Co.

Class K Associates: George Frank Diamos and Harry A. King, National Starch Products, Inc.; Edward H. Finsilver, Shawinigan Products Corp.; Albert F. Lane, Jr., Shell Chemical Corp.; Abe Michlin, Apex Drum Co.; Fred W. Mooney, Mooney Machine Mfg. Co.; Harry Novak, Monsanto Chemical Co.; Hal Parker, Martin, Hoyt and Milne; Bernard W. J. Pearce, Patterson Foundry & Machine Co.

In the absence of Ed Campbell, Educational Committee Chairman, President Barrett announced that the recent notices concerning the paint courses at the Los Angeles City College have been prepared and circulated in cooperation with the Paint, Varnish and Lacquer Association.

President Barrett read a letter of invitation from the Southern Paint and Varnish Production Club inviting all members who will be in the area to participate in their regional convention on March 3-5.

Plans for the Third Biennial West Coast Symposium, to be held in Los Angeles March 22-24, were announced by Symposium General Chairman Dan Heisler. The following men are to serve as chairmen for the various committees:

Exhibition Committee Chairman, Leo Forth; Vice-Chairman, Earl Hanson; Technical Committee Chairman, Bob Hollinger, Vice-Chairman, Jack Callaway; Registration Committee Chairman, Bob Swisher, Advisor, Dick Campbell; Entertainment Committee Chairman, Bo Dougherty; Publicity Committee Chairman, Knox Price.

Dr. J. C. Butler spoke on "Isophthalic—Its Properties and Uses in Vehicles and Alkyd Manufacture." He stated that the technical grade isophthalic acid composed of 98% isophthalic and 2% terphthalic would be available in commercial quantities near the end of 1955. This product which has a melting point of 670° F. exhibits greater heat stability with less tendency to form cyclic compound during alkyds manufacture. Although not soluble in oil at room temperature, isophthalic is more readily soluble than phthalic anhydride when heated.

Due to its greater functionality, isophthalic alkyds cannot be formulated below 60% oil length without the danger of gelation. However, with suitable modifiers such as ethylene glycol and benzoic acid, shorter oil alkyds can be made. In general, isophthalic alkyds are 10-15% longer in oil length than the corresponding phthalic alkyds. These longer oil alkyds exhibit the same drying properties and resistance properties but with an economy in manufacture, due to the use of additional oil. During the process of alkyd resin cooking with phthalic anhydride the half esters are not stable and the sublimation losses are great. However with isophthalic, the sublimation losses at 450° F. are less than those with phthalic anhydride due to the greater stability of the half esters. Therefore the important conclusion concerning the

*(Turn to page 75)*

# NEWS

## A[ S Paint Div. Meeting T[ Have Four Symposia

our symposia are scheduled for th Division of Paint, Plastics and Pr ting Ink Chemistry of the A erican Chemical Society at its 12 th National Meeting in the ba room of the Metropole Hotel, Cincinnati, Ohio, Mar. 29 to Apr. 7.

A. C. Zettlemoyer and Allen L. Alexander are chairman and secretary of the Division, respectively.

Program details of the Division, pertaining to paint chemistry, are as follows:

### Monday Morning and Afternoon

### Symposium on Adhesion

L. Reed Brantley, *Presiding*

9:00— 1. A. C. Zettlemoyer and L. Reed Brantley. Introductory Remarks.

9:05— 2. A. E. Austin and B. G. Brand. Adhesion as a Function of the Interface.

9:30— 3. Robert M. Gruver. Atomistic Approach to Adhesion to Glass.

10:00— 4. L. Reed Brantley, Kenneth Bills, Jr., and Barbara Stott. The Adsorption of Lacquer Components on Aluminum Oxide.

10:30— 5. James F. Murphy and Harold A. Page. The Reaction of Organic Resins with Surface Films on Aluminum.

11:00— 6. H. W. Fox, E. F. Hare, and W. A. Zisman. Wetting Properties of Organic Liquids on High Energy Surfaces.

:00— 7. Marshall R. Hatfield and George B. Rathmann. Application of Absolute Rate Theory to Adhesion.

:30— 8. A. C. Zettlemoyer, John C. Miller, and Raymond R. Myers. Tack: A Dynamic Aspect of Adhesion.

(*Turn to page 60*)

## CO-WINNERS OF GLYCERINE RESEARCH AWARDS

**Dr. Robert K. Summerbell, (left), professor of chemistry at Northwestern University, and Dr. James R. Stephens, American Cyanamid Co. research chemist (right), receive plaques as co-winners of the 1954 Glycerine Research Awards. Dr. H. C. Black, associate director of research, Swift & Co., (center), presented the awards which also carried a $1,000 check for each man.**

## R-B-H Building New Units For Added Dispersions Use

New manufacturing and shipping facilities are under construction at the Bound Brook plant of the R-B-H Dispersions Division of Interchemical Corp.

Two buildings—a two-floor wing on the main manufacturing building and a one-floor storage and shipping section—were started shortly after the first of the year. They are slated for completion by July.

The new manufacturing wing will increase production area in that unit by more than a third, and will provide on the second floor a large increase in storage space for raw materials. Shipping space and warehouse area for finished goods will be doubled.

The increased use of pigment dispersions is attributed by R-B-H Division President Harold D. Craft to "a broader use of color in all parts of our lives." He adds that it also reflects a growing concern of many industries to upgrade the quality of their products with fine dispersions of color.

The two-floor production wing is a major addition to the main R-B-H manufacturing building, completed in 1941.

## Emulsol Corp. Acquired By Witco Chemical Corp.

Witco Chemical Co., of New York City, has acquired the Chemical Div. of The Emulsol Corp., Chicago, Ill.

Benjamin R. Harris, identified with Emulsol since its inception will continue as President of that company. Solomon Epstein will serve as Executive Vice President. Changes in personnel or policy are not contemplated.

Witco, observing its 35 anniversary this year, operates 12 wholly-owned or associated plants and 10 sales offices in this country and one plant and two sales offices in England. These facilities will become available to Emulsol to augment the expansion of this corporation's activities in this country and abroad.

•

### Mexico Plant Opened

Expanded facilities for the production of Sherwin-Williams products in Mexico are now going into operation, according to Arthur W. Steudel, President.

Built at a cost of $500,000, the company's modern brick and concrete factory is situated on a six-acre tract which allows for further expansion. It is located at Vallejo, north of Mexico City, and replaces former facilities.

# NEWS

## Carbide and Carbon Opens Texas Chemicals Plant

Full-scale operation of a new chemicals plant at Seadrift, Texas for the production of ethylene oxide, polyethylene, and butadiene has been announced by H. B. McClure, President of Carbide and Carbon Chemicals Co., a Division of Union Carbide and Carbon Corp. Regular bulk shipments of specification grade materials are already being made.

At Seadrift, ethylene oxide is synthesized from ethylene by the direct oxidation process which Carbide pioneered in 1937. Ethylene oxide is the major raw material for more than 70 other chemicals vital to the chemical processing industry.

The major outlet for ethylene oxide has been in the manufacture of ethylene glycol, the essential ingredient in all-winter type anti-freeze such as Prestone. Ethylene glycol is also used in the manufacture of ethylene glycol dinitrate for low-freezing dynamite. Another important use for ethylene glycol is as a moistening agent for cellophane.

Seadrift is the fifth large-scale plant built by Carbide and Carbon for the production of ethylene oxide. The other plants are located at South Charleston and Institute, W. Va.; Whiting, Ind.; and Texas City, Texas. Carbide also has a sixth plant for ethylene oxide now under construction at Torrance, Calif. to be completed early in 1956. This plant will also be producing ethylene glycol and polyethylene.

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### H. E. Davis Reappointed

Harry E. Davis, Jr., vice-president of The Reardon Co., has been reappointed a member of the Technical Education Committee of the National Paint, Varnish and Lacquer Association. He has been instrumental in the establishment of paint technology courses at the University of Missouri School of Mines and Metallurgy, Rolla, Mo.

## 4th GENERATION OWNER STARTS NEW PLANT

**Lawrence Bowen, Jr., (third from right), who represents the fourth generation of active ownership of the business, turns the first shovelful of earth to begin construction on the new Pecora warehouse and general office building in Philadelphia. On hand for the ceremonies were (l. to r.) B. M. Croll of the Reading R.R.; Wesley Hibbert, executive vice president of Pecora; Walter P. Miller, president, chamber of commerce; William B. Bullock, Pecora's board chairman; Mr. Bowen; George Neale, general manager of the Philadelphia Inquirer; and W. S. Wilson of the Pennsylvania R.R.**

## Advance Solvents Buys Metalead Products Corp.

Arthur B. Mullaly, President of Advance Solvents & Chemical Corp., New York City, has announced purchasing control of Metalead Products Corp., Palo Alto, Calif. According to the announcement, no merger between the respective organizations is contemplated at this time.

Jerome L. Frankel has been appointed Manager of West coast operations and will supervise the new plant facilities at Palo Alto. He has been Advance Solvents' Traffic Manager for many years.

Mr. Frankel also recently became affiliated wth Metalead Products as Secretary-Treasurer, and in this capacity will direct their Leadleaf product sales and customer service activities.

Eugene Dondero who formerly assisted Mr. Frankel in the traffic department with headquarters at Jersey City, N. J., assumes the duties of Traffic Manager for Advance.

The Leadleaf Dept. markets "Metalead Paste," a paint pigment, increasing corrosion resistance when added to various metal primers.

## Harry M. Pier to Study Air Pollution Problems

Harry M. Pier, General Sales Manager of Research-Cottrell, Inc. has been appointed special assistant to the Chairman of the Board to conduct new studies in the field of atmospheric pollution.

He will coordinate the activities of Research-Cottrell, Inc. with those of industry, research and educational institutions and other interested organizations in this field. The appointment was announced by Dr. Joseph W. Barker, Chairman.

Charles E. Beaver, formerly Assistant Sales Manager, succeeds Mr. Pier as General Sales Manager.

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### Ultrasonic Corp. Formed

Incorporation of The General Ultrasonics Co., Hartford, Conn., to manufacture and market industrial ultrasonic processing equipment has been announced by Alexander S. Keller, Stanley R. Rich and Dr. Wilfred Roth, all of West Hartford, Conn.

The new corporation will handle the "Rich-Roth '400' Ultrasonic Generator" and associated transducers, which has already been introduced.

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# NEWS

### 67th Convention

The 67th annual convention of the National Paint, Varnish & Lacquer Association, Inc., will be held Oct. 31 through Nov. 2 in Washington, D. C.

Headquarters will be jointly at the Shoreham and Sheraton Park Hotels, where both business and social functions will be held. Registration and hospitality center will be at the Shoreham.

This year all activities will bear directly on the Association's work since there will be no meeting, as in the past, with the Federation of Paint and Varnish Production Clubs.

Room reservations cannot be made through the Association's office. Interested parties should use the forms sent out by the Association and make reservations direct to the hotel. If the hotel of your choice cannot accommodate you, your reservation will be made at the other hotel.

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### K. R. Brown to be Honored

Kenneth R. Brown, Vice President of Atlas Powder Co., Wilmington, Del., has been designated the 1955 honor award winner by the Commercial Chemical Development Association, it was announced by Nolan B. Sommer, President of the CCDA. The award will be presented to Mr. Brown on Mar. 17 at an Association dinner in his honor at the Hotel Statler, New York City.

The award, presented annually for outstanding achievement in the field of commercial chemical development, goes to Mr. Brown for his pioneering work in the development and marketing of sorbitol and related products. This chemical, which Atlas manufactures from sugar, was a test tube curiosity when Mr. Brown began his work several decades ago.

## Corrosion Research Study Assigned to N. D. College

The first phase of a major corrosion research program—under the sponsorship of the Federation of Paint and Varnish Production Clubs—has been assigned to North Dakota Agricultural College at Fargo, N. D.

Dr. Wouter Bosch, head of the Paint Technology Laboratory at the college, has been selected as coordinator of this project which will seek to determine the minimum paint film thickness for economical protection of hot rolled steel against corrosion.

Bosch

Hultz

Tomecko

Dunbar

Dr. Fred S. Hultz, president of NDAC, and Dr. P. E. Dunbar, dean of the School of Chemistry, both expressed interest in this assignment. Dr. Hultz wrote to Dr. James W. Tomecko, chairman of the Federation's Corrosion Committee:

"The news contained in your letter of the 29th of November that approval has been given to the Corrosion Committee for placing at our College the project "Minimum Paint Film Thickness for Economical Protection of Hot Rolled Steel Against Corrosion" with Dr. Bosch as Coordinator is indeed gratifying.

"The confidence of your committee and of the Board of Directors of the Federation in our ab ty to participate in this impor nt project will serve as a challeng to all of us here to go forward wit it expeditiously and effectively. I am sure that your commi e shares with me the belief that r. Bosch is one of our most compet t and able research workers in pa t problems."

#### Operates Summer Short Courses

Dr. Bosch is well-known to e decorative and protective coati s industry. In addition to bei g Head of the Paint Technolo y Laboratory, he has, for a number f years, operated the Summer Sh t Courses for beginners and advanced students in paint technology at NDAC and has appeared on many Federation programs. This assignment occurs on the 50th anniversary of the founding of the Paint Technology Course at North Dakota Agricultural College.

The Federation Corrosion Committee membership for 1954-55 is as follows: Dr. Tomecko (Montreal Club); Dr. Bosch; H. L. Crawford (Houston Club); T. A. Dembski (New England Club); M. P. Feely (Toronto Club); C. M. Jackson (Louisville Club); C. G. Moore (Chicago Club); G. G. Schurr (Chicago Club); J. Skala (Northwestern Club); and G. H. Wescott (Philadelphia Club).

### Marbon to Acquire Option

The Marbon Chemical Division of Borg-Warner Corp. plans to acquire an option on a 300-acre plant site at Washington, W. Va., Robert Shattuck, President and General Manager of the division, has announced.

This will permit extension of manufacturing operations, which now are conducted in plants located at Gary, Ind. Marbon's principal products are materials used in the rubber and paint industries.

### New A'ssn Tariff Chairman

Maro A. Dupont, vice president of General Paint Corp. and general manager of its Export Div., has been named chairman of the Tariff Committee of the National Paint, Varnish & Lacquer Assn., national headquarters in Washington, D. C. announced.

The committee's work is aimed at fostering increased international commerce in the industry. In this connection, Mr. Dupont is scheduled to leave for the Far East, to visit overseas distributors.

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# varnishes without cooking!

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It's true. You can now prepare varnishes without cooking. It is the first practical innovation in varnish making procedure in many years . . . a revolutionary development of Bakelite Company.

The "COLD-MIX" method is unique to BAKELITE Brand Phenolic Resin BR-9400. Of all 100% phenolic varnish resins tested, BR-9400 is the first of this type to permit this economical varnish preparation. Tests to date indicate quality equivalent to cooked varnishes. Procedure is simple. Results are excellent.

"Cold-Mix" coatings exhibit exceptionally fast surface dry, through dry, and produce hard, resistant films. Like standard cooked BR-9400 varnishes, they are gas proof, non-reactive with basic pigments, have good package stability, and excellent resistance to skinning.

Now you can obtain the greatest possible formulation flexibility with a minimum inventory. The abrasion resistance, drying speed, hardness, and water spotting resistance of economical coatings can be improved over an extremely wide range while maintaining only a basic stock of varnishes.

Send today for Temporary Technical Bulletin No. 227. Description, applications, manufacturing procedure, and suggested formulations are outlined. Write Dept. BK-75.

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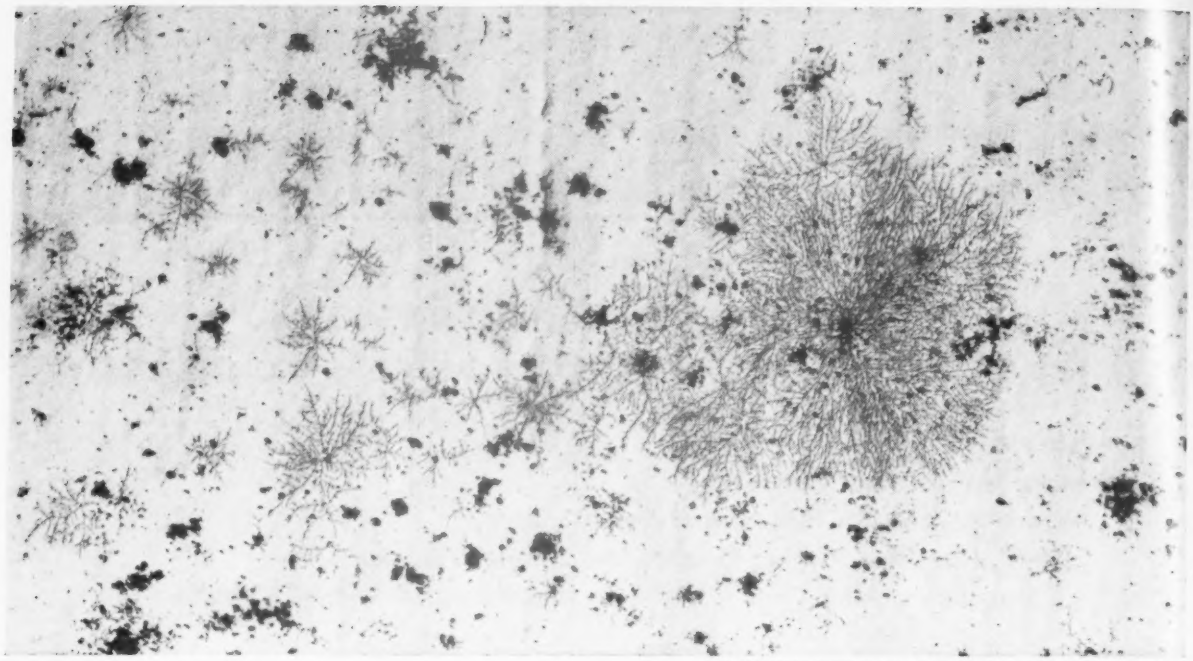

TEN DIAMETER PHOTOGRAPH OF MILDEW AT NEW ORLEANS TEST SITE

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## Leaded Zinc Oxide

WITH EAGLE-PICHER LEADED ZINC OXIDE in your house paint formulation, you can provide improved resistance to mildew. Yes, scientific tests prove that house paints formulated with Eagle-Picher Leaded Zinc Oxide not only resist mildew discoloration but offer far superior decorative value and longer life at low cost.

**HERE'S PROOF OF MILDEW RESISTANCE IN HOUSE PAINTS!**

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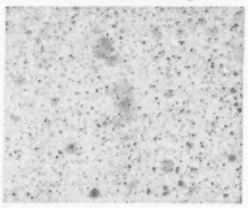

**Mildew discoloration** after 5 months vertical south exposure, without Eagle-Picher Leaded Zinc Oxide. (No fungicide used.)

**No mildew** after 5 months vertical south exposure, with paint* made from Eagle-Picher Leaded Zinc Oxide. (No fungicide used.)

***Formulation of Leaded Zinc Oxide Paint Used in Test**

| Pigment—62.2% | | Vehicle—37.8% | |
|---|---|---|---|
| E-P #356 Leaded ZnO | 50.0% | Raw Linseed Oil | 60.5% |
| $TiO_2$—Anatase | 15.0 | Z-3 Linseed Oil | 19.5 |
| Magnesium Silicate | 35.0 | Mineral Spirits | 18.2 |
| | 100.0% | 24% Pb | 1.3 |
| | | 6% Co | .5 |
| | | | 100.0% |

PVC—32.0%

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# NEWS

Mayor Celebrezze of Cleveland, left is presented with a gold plated "Handi-calk" cartridge by Norman M. Cornell, President of Gibson-Homans. The event celebrated the company's production of the 20,000,000th cartridge. Vice President Harry Hutson is shown looking on.

## Pennsalt Buys Index Co.

The Pennsylvania Salt Manufacturing Co. has acquired a major interest in the Index Chemical Co. of Houston, Texas, George B. Beitzel, Pennsalt President has announced. Index, said to be first in the United States to produce ethyl and methyl mercaptans synthetically for commercial sale, also produces dimethyl and diethyl sulfides.

Index activities will be integrated with the production and sales departments of Sharples Chemicals Inc., a Pennsalt subsidiary and pioneer producer of related synthetic organic sulfur compounds.

## Expect 700 to Attend

Upwards of 700 chemists and chemical engineers are expected to attend the 38th Annual Conference of The Chemical Institute of Canada in Quebec City, May 30, 31, June 1, 1955.

Featured events will include the award of the 1955 Chemical Institute of Canada Medal to an outstanding chemist, as well as two special lectures by prominent scientists. About 100 papers by authorities in their fields will be presented in such subjects as protective coatings, agricultural chemistry, analytical chemistry, biochemistry, chemical education, chemical engineering, and organic and physical chemistry.

# Half-second butyrate –the key to durable outdoor lacquers for aluminum

For economical aluminum lacquers of great outdoor durability we can unreservedly recommend half-second butyrate.

The results of our own development work, plus reports coming to us from actual field tests, indicate that half-second butyrate is providing outstanding protection to aircraft, truck trailers, structural sections and other aluminum surfaces equally difficult to protect. One-year performance tests have just been completed on a commercially operated airliner, for instance, with completely satisfactory results. In another case, performance tests on an over-the-road truck trailer have just passed the eight-month mark with the half-second butyrate lacquer still in excellent condition.

Half-second butyrate is a dry powder, safe to ship in multiwall paper bags and easy to handle. It is highly soluble with a low viscosity build-up in economical solvents such as a mixture of toluene and ethyl alcohol. No other easily sprayable film former exhibits such a high degree of ultra-violet light stability, strength, flexibility and all-'round resistance to attack. Its many advantages make it a superior film former in numerous lacquer formulations.

Write for samples of half-second butyrate and suggested formulations.

**SALES OFFICES: Eastman Chemical Products, Inc.,** Kingsport, Tenn.; New York—260 Madison Ave.; Framingham, Mass.—65 Concord St.; Cincinnati—Carew Tower; Cleveland—Terminal Tower Bldg.; Chicago—360 N. Michigan Ave.; St. Louis—Continental Bldg.; Houston—412 Main St. **West Coast—Wilson Meyer Co.;** San Francisco—333 Montgomery St.; Los Angeles—4800 District Blvd.; Portland—520 S. W. Sixth Ave.; Salt Lake City—73 S. Main St.; Seattle—821 Second Ave.

## Aluminum lacquers made with half-second butyrate resist

**Peeling**
**Whitening**
**Yellowing**
**Hydraulic Fluids**
**Gasoline and Oil**
**Steam Cleaning**
**Salt Spray**
**Mortar Alkalies**
**Rapid Temperature Changes**
**Abrasion**

**Eastman** CHEMICAL PRODUCTS, INC., KINGSPORT, TENNESSEE, a subsidiary of EASTMAN KODAK COMPANY

# NEW MATERIALS & EQUIPMENT

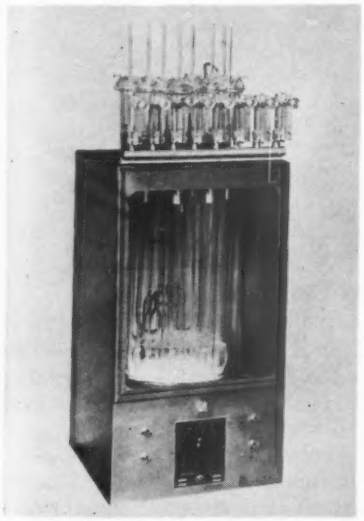
A MONTHLY MARKET SURVEY

**This section is intended to keep our readers informed of new materials and equipment. While every effort is made to include only reputable products, their presence here does not constitute an official endorsement.**

## CONST. TEMP. BATH

**For Many Uses**

A constant temperature bath adaptable for many uses, originally developed for Turbine Oil Oxidation Test A.S.T.M. D 943, is said be usable also be for Kinematic Test A.S.T.M. D 445, Transformer Oil Oxidation Tests, and all types of constant temperature work requiring temperatures up to 100°C. and sensitivity of control to ± .01°C.



LABLINE

The unit consists of a 12″ dia. x 18″ high pyrex jar enclosed in stainless steel jacket, with transparent plastic window. Stirrer is induction type, with special centrifugal impellor. Temperature control utilizes electronic relay pulling only 5 microamperes and adjustable Roto-Set Regulator. Fluorescent light is said to give complete interior illumination.

Modifications can be made to suit individual requirements. Labline, Inc., 217-221 N. Desplaines St., Chicago, Ill.

## LIFT TRUCK

**Single, Double-Faced Pallets**

"Pallet Ox" is designed to provide a moderate cost, a motorized system for the horizontal movement of Pallet loads. Manufacturer claims that it is adaptable to single and double-faced pallets.

The battery-powered walking operator truck lifts and travels electrically. Features claimed are minimum physical effort on the part of the operator; no pushing, pulling or straining, even with heavy loads; all operation effected by finger tip push button control located in the handle. The truck is built with capacities of 4000 and 6000 pounds, and a 4-inch lift is standard. Fork lengths from 36″ to 60[11] are available. The battery furnished with the unit is said to be large enough to assure eight hours operation without recharging. Barrett-Cravens Co., 630 Dundee Rd., Northbrook, Ill.

## YELLOW PIGMENT

**With Alkali and Heat Resistance**

"Sun Yellow N," issued to meet the demand for a stable yellow pigment for outdoor coatings, is said to combine outstanding light fastness with alkali and heat resistance. Manufacturer claims it can be used in any type of finish where an extremely permanent yellow color is desired. Interest is being shown in the product for sign enamels and automotive finishes as well as for exterior paints for stucco, concrete and wood siding.

Company says this pigment has a rating of excellent on acid, alkali, sulphur fume, and heat resistance. Hiding power is claimed slightly less than rutile $TiO_2$ and considerably greater than anatase $TiO_2$.

The Harshaw Chemical Co., 1945 E. 97th St., Cleveland 6, Ohio.

BLACKMER

## HAND PUMPS

**Handles Solvents**

The "Flow-Master" is designed to handle a wide range of liquids including petroleum products, water, alcohol, etc., without corrosion. It incorporates a diecast aluminum-alloy pump body, composition piston rings and stainless steel shaft and valves.

Company says this pump is rated at 25 gallons, delivers one full quart for each complete stroke, is self-priming and under normal conditions its vacuum ability is approximately 25 feet suction lift. It is said to feature ease of operation being lightweight and compact for easy installation or transferring from one operation to another.

A flow register for measuring the volume of liquid delivered is provided as optional equipment. Also optional is a safety device which provides for "draining back" the fluid from the pump and discharge fittings after each pumping operation, thus preventing the possible dangerous spillage of liquid.

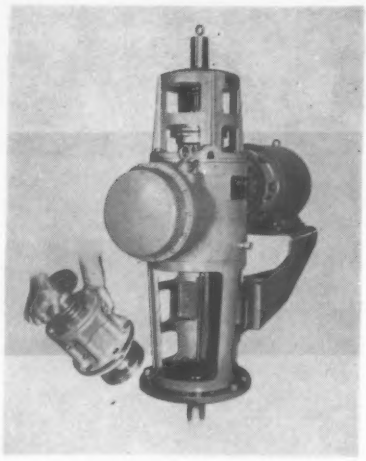
Company claims no special locking attachments are needed since a feature of the standard design provides for simple locking with a padlock. Blackmer Pump Co., Grand Rapids, Mich.

## NEW MATERIALS — EQUIPMENT

### ROTARY SEAL CARTRIDGE
**For Fluid Mixers**

A rotary mechanical shaft seal in an easily-replaceable cartridge assembly has been designed especially for service in fluid mixing applications. It is available in either single or double types, on all models of "Lightnin Mixers" where shaft sealing is required, and in a variety of materials to suit any fluid mixing conditions.

Company claims that positive, leakproof sealing of tank liquids, vapors or gases is provided by the seal which is said never to require adjustment while in service.



MIXING EQUIPMENT

The seal is assembled in a cartridge as a single component. Using only a wrench, the assembly can be easily uncoupled, removed, and replaced in just a few minutes without dismantling the mixer or removing it from the tank, and without emptying the tank, according to the company. Shaft alignment is automatic, and need not even be checked.

A locking collar arrangement is said to make it possible to replace the seal of a mixer that is entirely below the liquid level, or on a pressure vessel, without loss of product or pressure.

The single seal assembly is used in applications where the sealing faces are lubricated by the tank contents, and where service conditions are not severe.

The double seal is applied to mixers where the tank contents will not lubricate the sealing faces, where they contain abrasives, or under conditions of high temperature or pressure.

The double seal assembly is available in types suitable for pressures ranging up to 1200 psig, and for temperatures ranging from −120° to +485° F.

Additional information can be obtained from Mixing Equipment Co., Inc., 158 Mt. Read Blvd., Rochester 11, N. Y.

### POLYVINYL EMULSIONS
**Suitable as Binders**

Company claims to have developed methods for preparing stable, water-based emulsions from "Thiokol" liquid polymer.

Potential applications include flexibilization of water-dispersed phenolic, urea and epoxy resins for coatings and adhesives. The emulsions are said to be of fine particle size potentially suitable as binders and impregnants for wood, paper, textiles, felt and other water absorbtive materials.

The dispersed "Thiokol" liquid polymer is an organic polysulfide polymer that can, company says, be cured to a resilient rubber with excellent oil and solvent resistance; good aging characteristics; impermeability to gases and moisture; and excellent low temperature properties.

Thiokol Chemical Corp., 780 N. Clinton Ave., Trenton, N. J.

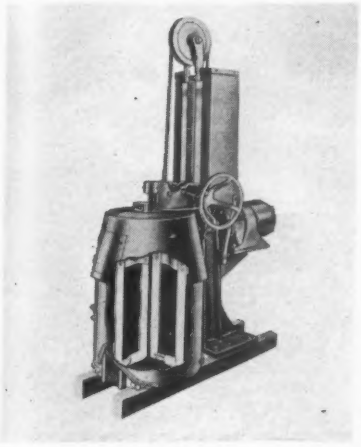
## NEW MATERIALS — EQUIPMENT

### CHANGE CAN MIXER

**Double Motion Type**

The "#30 DM" double motion change can mixers are specially designed to mix the heaviest materials more thoroughly and in less time than previous types of change can mixers.

The greater effectiveness of their mixing action is said to be due to the double planetary type stirrer action. Each stirrer revolves on its own axis, and, in addition, both stirrers are revolved at a slightly slower speed around the entire inside of the mixing can. The stirrers sweep close to each other and close to sides of can twelve times during each revolution of stirrers around the can.



ROSS

Company says the close clearances maintained produce a highly beneficial compressive and shearing action on the material being mixed, and that in many cases the partial dispersion obtained reduces production costs in subsequent operations. The stirrers sweep the entire area at bottom of can, and dry or inert pockets are claimed unable to form since all of the batch is thoroughly contacted by the stirrers.

Another feature claimed is that the can does not revolve which enables it to be fitted with a slide lever gate for complete emptying without removing from the mixer.

In addition, the mixers feature a special raised base to permit use of a lift truck for moving cans directly to or from the mixer. Mixers are available in 20, 60 or 80 gallon production sizes. Charles Ross & Son Co., 148-156 Classon Ave., Brooklyn 5, N. Y.

### DRY ICE CONVERTERS

**Supply Vat Agitation**

This dry ice converter takes a full 50-lb. cake of commercial dry ice which is loaded into a "full opening" cylinder built to A.S.M.E. specifications. The cylinder is then sealed by a patented, quick-closing, easily operated door. The dry ice immediately begins to convert to gas, according to the company.

Paint and varnish plants can pipe the gas to their mixing vats, locating the converters at any convenient spot which is out of the way of their operations. The converters may be installed either vertically or horizontally, as units or in multiples as batteries, according to plant needs. The cost of dry ice is approximately 50% of the cost of an equivalent amount of carbon-dioxide cylinder gas.

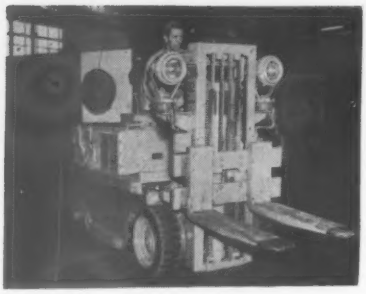
Dry Ice converters are manufactured in three sizes: 300-lb., 600-lb., and 1000-lb. capacities. The 1000-lb. converter stores approximately 8,700 cu. ft. of carbon-dioxide gas which can be drawn off at any rate up to 900 cu. ft. per hour. The converter is said to require no attention while storing gas, and need no electrical or other power for operation. Dry Ice Converter Corp., Tulsa, Okla.

## NEW MATERIALS — EQUIPMENT

### CARLOADER
**Explosion-Proof**

To transport containers of flammable liquids safely from storage to hazardous processing areas, this Clark electric carloader is equipped with two Crouse-Hinds explosion-proof "RCDE-6" floodlights. Other explosion-proof equipment includes a compound wound motor which powers the truck's lift and tilt system, batteries, and all wiring, connectors, and control switches.

Company says that the trucks are individually inspected before being approved by Underwriters,



CROUSE-HINDS

Laboratories for locations where such flammable volatiles as gasoline, petroleum, naphtha, alcohols, acetone, lacquer solvent vapors or natural gas are used.

The housing, door, and mounting of the floodlight is cast of lightweight aluminum. The plain tempered glass lens is held to the door by a clamping ring which screws into the door frame. Between the door and the housing is a threaded joint, machined with at least five full threads claimed to make it flame-tight. This joint allows flammable substances to seep into the floodlight's interior where, upon contact with an electric spark, they explode. But the housing is said to be sturdy enough to repeatedly contain any number of such explosions. The joints are said to relieve explosion pressure by allowing the cooled exhaust gases resulting from the explosion to escape harmlessly to the outer atmosphere.

Crouse-Hinds Co., Wolf & Seventh North Streets, Syracuse, N. Y.

### DUAL TITROMETER
**Ease of Operation**

The redesigned "Dual Titrometer" is said to provide greater sensitivity, wider range and easier operation.

Developed in cooperation with Shell Development Co., and originally intended for the determination of acidity of lubricants, the unit is claimed to be applicable to a wide range of other opaque and highly colored solutions where the usual color indicator titrations are not practical. Among these are polymers, common solvents, fats, asphalts, rubber, vegetable and animal oils, waxes, greases, and water solutions. It is also said to be suitable for ASTM Methods D 664 and D 939.

Extremely sensitive, the titrometer is claimed to actually respond to an electrode current of the order of only $10^{-13}$ amperes. A full pH range is measurable to 0.02 pH unit.

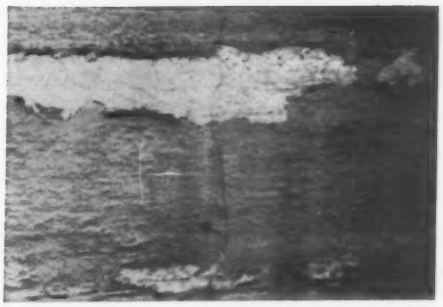
Two complete titration stands permit two titrations to be run simultaneously. Readings are taken from a continuously indicating meter dial, greatly reducing the chance of error in determining end points. Use of "Mag-Mix" variable speed stirrers simplifies setting-up, operation and cleaning. Literature on request from Precision Scientific Co., 3737 W. Cortland St., Chicago 47, Ill.

DOW

# Exterior LATEX MASONRY PAINTS stay fresh and clean far longer . . . make repainting easy

## Extensive tests prove Latex Paints are self-cleaning . . . chalk gradually to provide an ideal, repaintable surface

*Providence Hospital, Oakland, California. Walter Blumert and Company, Painting Contractor*



**NO SUCH FAILURE FOR LATEX PAINTS!**
**Surfaces protected with latex paint stay clean and fresh . . . without rust stains, ground stains, or water spots . . . and without blistering or peeling. They're ready for repainting with a minimum of preparation.**

Whether you make or buy exterior masonry paints, it will pay you to get the facts on the *wearing* qualities of latex paints. Here are the modern paints that provide today's handsomest exteriors . . . and look ahead to the easiest repainting ever.

*All* paints fail in time . . . but the important difference is that latex paints stay fresh and clean far longer and chalk gradually to provide a repaintable surface with maximum adhesion, eliminating the need for extensive surface preparation. Test after test proves that Dow Latex 512K (styrene-butadiene) makes durable masonry paints that won't mildew, yellow with time or retain dirt, and because they let the masonry breathe, they won't blister and peel.

These proved advantages, added to latex paint's fame for quick drying, lack of painty odor, ease of application, fast equipment clean-up, give latex paint every sales benefit. Write for the informative booklet, "Dow Latex 512-K for Exterior Latex Paints." THE DOW CHEMICAL COMPANY, Midland, Michigan, Plastics Sales Department PL 503E.

*you can depend on DOW PLASTICS*

DOW

# NEWS

## Bermuda Vacation Prize In A-D-M Coloring Contest

An all-expense Bermuda vacation for two is the grand prize in a national coloring contest for adults sponsored by Archer-Daniels-Midland Co., Minneapolis.

The winning couple will receive free air transportation, a week's stay at the Hotel Princess plus spending money.

Patterned after successful contests in such merchandising-minded industries as food and soap, the Bermuda competition is designed to stimulate further interest in week-end decorating, thus increasing the sales of paint and decorator supplies.

Key to the contest is the "Color Schemer," an adult coloring booklet, prepared by ADM. Contestants pick up the booklet from their paint dealer, color the four rooms pictured in outline drawings with water colors, crayons or colored pencils and return the finished entry to the dealer who forwards them to his paint manufacturer. Contestants choose color schemes for four rooms: living room, bedroom, kitchen and rumpus room.

## Troy Chemical Appoints Southern Representative

The Troy Chemical Co. has announced the appointment of A. J. Passonno as the company's representative in Alabama, Georgia, Florida and Mississippi.

A. J. Passonno

Mr. Passonno, whose headquarters will be P. O. Box 623, Tampa, Fla., has been connected with the paint manufacture business for the past 29 years. He was active as a paint manufacturer, was Chief of the Protective Coating Section of the Engineer Board from 1942 to 1946, was in charge of protective coatings and tropicalization for the Office, Chief of Engineers and to the U. S. Navy, Bureau of Yards and Docks.

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## Mobile Unit Brings Info

The Mobile Lacquer Information Center of Hercules Powder Co. has visited eight southern and midwestern states bringing the latest developments in lacquers, inks, and production finishes to the attention of industry in 16 cities. In addition it made a stop at the Southern Paint and Varnish Production Club Convention, Mar. 2 to 5, at the Biltmore Hotel Atlanta, Ga.

The Lacquer Information Center is a huge trailer fitted up with several display units. It serves as a traveling study room and demonstration laboratory and is staffed by representatives of Hercules' lacquer promotion group and research staff.

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## Harshaw Stock Offered

The Harshaw Chemical Co. has announced an offer which would enable them to acquire all outstanding stock of Zinsser & Co., Inc., in exchange for Harshaw common stock. Although details of the proposal have not been fully worked out, Harshaw has said that it contemplates continuing the Zinsser operation at its present location in Hasting-on-the-Hudson, a few miles from New York City.

# NEWS

## National Buys Pacific Can Becoming 3rd in Industry

National Can Corp., Chicago, Ill., has become one of the top three in the industry with the purchase of Pacific Can Co. in a $19,000,000 transaction.

The acquisition puts National just behind American Can and Continental. Sales of National last year were over $40 million and Pacific's were $32 million.

Robert Solinsky, National President, will be president and chief executive officer. E. F. Euphrat, formerly president of Pacific, will be Chairman of that company. Pacific's other top management will remain in their present capacities.

Donald C. Lillis, partner in the New York investment firm of Bear, Stearns and Co. and Chairman of National who headed a syndicate which put the deal together, announced the purchase was carried out exclusively through debt financing and that National acquired five west coast plants which now makes a total of 12 owned by the company throughout the country.

The multi-million-dollar purchase was financed through borrowing. National obtained $12.5 million from institutional investors. This was arranged by the First Boston Corp. and included the New York Life Insurance Co., Continental Assurance Co., Jefferson Standard Life Insurance Co. and Fidelity Mutual Life Insurance Co., and the Provident Mutual Life Insurance Co. A total of $4.5 million in 5% subordinate convertible income debentures was offered to stockholders of National and was underwritten by a syndicate headed by Bear, Stearns and Co. and A. C. Allyn and Co. Another $2 million was provided by a private investor.

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## Instrumentation Course

A one-week industrial instrumentation course given free of charge periodically by Fischer & Porter Co. at the Hatboro, Pa. plant has been completed by nine technicians. They came from the chemical, instrument, and research industries, located in seven northeastern and middle-western states.

The course includes a general coverage of instrumentation.



## GLYCERINE RESEARCH

(*From page 31*)

than they have displaced them.

One example of this is in the field of styrenated alkyds, where alkyds are an intermediate for further synthesis.

Epoxy resins have been very successful, having high resistance to alkali—but then it has often been considered desirable to use these resins along with alkyds in the same coating system.

Alkyds have been used advantageously alone or partially with other resins in emulsion type coatings.

The total effect is that there is a present tendency for alkyds to be used in no less volume than formerly.

In making an effort to see that glycerine is honestly evaluated among other polyols, we are contributing our share in the promotion of alkyds in competition with other resins.

## ACS PAINT DIV.

(*From page 41*)

3:00— 9. Frank Moser. The Adhesion of Polymeric Substances to Glass.

3:30—10. C. McBurney and E. H. Sorg. Properties of Polysulfide Liquid Polymers-Epoxy Resin Coating and Adhesive Compositions.

4:00—11. E. W. McGuiness. Thermal Stability of Epoxy Type Adhesives.

4:30—12. Max Kronstein and William H. Kapfer. New Methods for the Evaluation of the Effect of Impact Tests on the Life of Paint Systems over Metal Phosphate Treatments on Steel.

### Tuesday Morning

### Symposium on Adhesion

L. Reed Brantley, *Presiding*

9:00—13. John E. Rutzler, Jr. and William R. Dawson. Effects of Stress on Electrical Properties of Films of Plastics Bonded to Metals.

9:30—14. John E. Rutzler, Jr. and Thomas C. Wilson. Stripping of Bonded Films of Plastics by Electrolysis.

10:00—15. Selby M. Skinner. The Transient Electrical Potential Associated with Breaking Structural Adhesive Bonds.

10:30— Panel Discussion.

12:15— **Advisory Committee Luncheon.**

### Tuesday Afternoon

### General

A. C. Zettlemoyer, *Presiding*

2:00—16. Robert M. Evans and Edward G. Bobalek. An Accelerated Test for Fungal Deterioration of Weathered Organic Coatings.

2:25—17. Raymond R. Myers. Quantum Aspects of Catalysis. I. Oxidations and Other Reactions of Ethylene.

2:50—18. S. Gusman and J. D. Stroupe. Deterioration of Synthetic Enamels. I. Absorption of Solar Energy.

3:15—19. Henry Burrell. Solubility Parameters for Film Formers.

3:55—20. Worth Wade, Ralph Winters, Derek Till, and Laurence Hervey. The Production of Micro-Fibers.

4:20— **Business Meeting.**

5:15— **Divisional Social Hour.**

### Wednesday Morning

### Symposium on Cure in Thermosetting Resins

H. P. Wohnsiedler, *Presiding*

9:00—21. H. P. Wohnsiedler. Introductory Remarks.

9:05—22. Eugene Barr. The Degree of Cure of Thermosetting Resins, Historical Review.

9:30—23. F. J. McGarry, G. A. Sofer, E. A. Hauser, and A. G. H. Dietz. Ultrasonic Waves as a Measure of Cure in Thermosetting Resins.

# A VOICE IN THE DARK

LOSS OF DRY, SLEEPY DRYING & STAINING ARE GIVING ME TOO MANY HEADACHES!

# LIGHT ON THE SUBJECT!

℞ Use Oronite Naphthenate Driers with Nilskin as your anti-skinning agent thereby insuring against the introduction of modifying agents and impurities which could react with vehicles, pigments and other additives and cause these troubles.

NAFTONE INC

515 MADISON AVENUE
NEW YORK 22, N. Y.

10:00—24. H. Dannenberg and W. R. Harp, Jr. Determination of the Cure and Analysis of Cured Epoxy Resins. I. Determination of the Conversion.

10:25—25. H. Dannenberg. II. Estimation of the Cross-Linking.

10:50—26. Manuel F. Drumm, Lawrence E. Nielsen, and Charles W. H. Dodge. Determination of Degree of Cross-Linking of Phenol-Formaldehyde Novolac Resins by Dynamic-Mechanical Measurements.

11:20—27. H. P. Wohnsiedler, I. H. Updegraff, and R. H. Hunt, Jr. Degree of Reaction and Cure in Melamine Plastics: Influence of Cross-Linking on Properties.

**Wednesday Afternoon**

**Symposium on Cure in Thermosetting Resins**

H. P. Wohnsiedler, *Presiding*

2:00—28. Leon Shechter and John Wynstra. Glycidyl Ether Reactions. I. The Alcohol-Glycidyl Ether Reaction.

2:30—29. Leon Shechter and John Wynstra. II. The Phenol-Glycidyl Ether Reaction.

2:55—30. Leon Shechter and John Wynstra. III. The Carboxylic Acid-Glycidyl Ether Reaction.

3:20—31. Leon Shechter, John Wynstra, and Raymond Kurkjy. IV. The Amine-Glycidyl Ether Reaction.

3:45—32. Keith R. Cranker and Alan J. Breslau. Polysulfide Liquid Polymer/Epoxy Resin Casting Compounds.

4:15—33. H. A. Clark and K. R. Hoffman. Effect of Glass Fibers on the Cure of Silicone Resins.

4:40—34. I. J. Gruntfest and E. M. Young, Jr. Catalysis of Urea-Formaldehyde Condensation.

**Thursday Morning**

**Symposium on Taste and Odor Aspects of Paints, Plastics and Printing Inks**

J. K. Craver, *Presiding*

9:00—35. J. K. Craver. Introductory Remarks.

9:05—36. Lewis Fowler and Mary Lou Fischer. The Organoleptic Panel in Production Control.

9:30—37. B. H. Cummings and H. W. Brough. A Study of Odor Quality. Evaluation of Isopropyl Alcohol.

10:00—38. K. S. Konigsbacher and M. Berdick. Comparison of Paint Odors by Sensory Panel Techniques.

10:30—39. J. W. Prane. Statistical Evaluation of Odor Levels in Flat Wall Paints.

11:00—40. L. C. Cartwright. Odor and Flavor Considerations in the Printing of Containers.


National Lead Company, Experimental Test Station, Sayville, Long Island, is set up to develop facts on the durability, beauty, and practicability of house paints. In existence since 1917, it now has 2½ miles of test fences, more than 30,000 active tests.

# FOOLPROOF

## *your exterior paints with Dutch Boy® "45X"*

***(Basic Silicate White Lead)***

TAKE IT from leading makers of exterior paints: for *uniform* performance, you need lead.

And take it from Sayville, National Lead's Experimental Test Station, "Dutch Boy" Basic Silicate White Lead "45X" *assures* uniform performance. No matter how much exposure conditions – or painting practices – vary!

Think about your white House Paints, for example.

With "45X" – Sayville tests show – you definitely improve self-cleaning. Yet, you preserve film integrity!

In tinted House Paints, you step up film durability with "45X". Also resistance to color changes! In Primers, you step up adhesion.

And so it goes!

Everytime you put "45X" into exterior paints, you improve one property or another underlying *uniform* performance.

This minimizes complaints. Saves you time. And money! You, you alone, know what it costs to run down complaints yearly. And the complaints you *don't* hear about! Even you don't know what they cost – in repeat business and good-will.

***Fewer complaints—***
***fewer pounds of lead, too!***

That's because the reactive portion of each "45X" pigment particle is concentrated at the surface. This makes proportionately larger amounts of lead *available.*

Fewer complaints, fewer pounds of lead! You just can't lose, putting "45X" in your exterior paints!


**National Lead Company:** New York 6; Atlanta; Buffalo 3; Chicago 80; Cincinnati 3; Cleveland 13; Dallas 2; Philadelphia 25; Pittsburgh 12; St. Louis 1; San Francisco 10; Boston 6 (National Lead Co. of Mass.). In Canada: Canadian Titanium Pigments Ltd., 630 Dorchester St., W., Montreal.

# NEWS

## Champion Paint Purchases New, Larger Facilities

Champion Bronze Powder & Paint Co., Chicago, Ill., has purchased a larger plant and adjoining vacant land in the same city. Building, scheduled for May completion, will give the company a 10,000 square foot addition. This will provide for almost 40,000 square feet of building plus plenty of space for future growth.

The new building, contemporary in design, uses brick, concrete and steel, and aluminum sash on front elevations. It will be a one and partially two story structure designed for extra heavy floor loads, permitting addition of a second story which would extend the second floor of the existing improvements.

Completely fireproof and explosion-proof, the new construction will use concrete and fire protected steel, collapsible windows and explosion-proof motors and lighting. General offices will occupy the front of the first floor in both the existing and part of the new building. They will be completely air conditioned.

Twelve tanks of 5,000 to 10,000 gallon capacity are being imbedded in the floor of the basement. Solvents, resins and varnishes will be stored here and pumped to the second floor. There all liquids will be pumped through automatic meters, permitting pinpoint distribution to any desired tank. Proper loading of required formulations into any paint tank will be accomplished simply by operation of the respective valves. Correct amounts of raw materials are automatically controlled by meters and never vary in their accuracy.

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## Daniel Co. to Market Specialty Products

The Daniel Products Co. has been organized to market specialty products to the protective coatings industry, according to Frederick K. Daniel, President.

F. K. Daniel

The company, with offices and laboratory in New York City, is now selling a line of color dispersions of certified tinting strength under the name of "Tint-Ayd" dispersed colors. Technical service on dispersion problems will be provided by the company.

The new company will also sell a new type of protective colloid under the name of "Proloid B-S" which it claims reduces costs and simplifies manufacture of butadiene-styrene latex paints.

The D. H. Litter Co., Inc. has been appointed sales agents for the company for the New York, New England and New Jersey area.

•

### New Appointments

The Raw Materials Div. of Tamms Industries, Inc., Chicago, has recently appointed new representatives in the following areas:

Robert Chenoweth, 531 Esperson Bldg., Houston 2, Texas; Victor Roberson Co., 4515 Olive Street, St. Louis 8, Mo.; Russell & Palmer Co., P. O. Box 267 Custom House Station, New Orleans, La.; Robert F. Sheahan Co., Suite 728, M & M Bldg., Memphis 2, Tenn.

# YOU CAN ALWAYS DEPEND ON

## PHILLIPS 66 SOLTROL*

## ODORLESS MINERAL SPIRITS

***DEPENDABLE PERFORMANCE!*** You are assured of controlled evaporation rates with both Soltrol 130 and Soltrol 170. Soltrol 130 for faster drying. Soltrol 170 for longer wet edge. Yes, you know what you're getting . . . every time . . . because these Phillips products are carefully controlled through all steps of their manufacture to assure uniformity.

***DEPENDABLE SUPPLY!*** When you do business with Phillips you can count on a reliable source of supply and prompt, fast service, too. Soltrols are available in 4,000 or 8,000 gallon tank cars. Or you can order 6,000 gallon compartment cars containing both Soltrols.

### *FREE TEST SAMPLES*

Like to test Phillips 66 Soltrols? We'll gladly send you samples for evaluation. Just tell us how much Soltrol you need to prove to yourself the advantage of odorless Soltrols in your products.


**PHILLIPS PETROLEUM COMPANY**
**SPECIAL PRODUCTS DIVISION**
**BARTLESVILLE, OKLAHOMA**

*A Trademark

**Apprentice painters Robert Zulick and Wayne Vajgert, who attend the Washburne Trade School in Chicago, watch a paint canning operation in the National Chemical and Manufacturing Co. plant where Luminall paints are made. Nearly 200 students made a tour of the plant and viewed paintmaking first hand. Painters shown at work are Eugene Racinowski (left) and Henry Williams.**



## Foster D. Snell Buys Crippen Laboratories

Foster D. Snell, Inc., Chemical and Engineering Consultants, New York City, has purchased the Crippen and Erlich Laboratories, Inc., of Baltimore, Md.

Under the new ownership Raymond C. Crippen will continue as Secretary-Treasurer of the corporation and director of the laboratory which will operate as a wholly owned subsidiary of Foster D. Snell, Inc. Other officers will be Dr. Foster Dee Snell, President, and Dr. Chester A. Snell, Vice President.

The Baltimore facilities include a paint and varnish lab, an analytical, instrument, fuel and oil testing, organic, and metal analysis and corrosion testing laboratories. Also a small machine shop and pilot plant.

•

## Sheffield Chemical Made Beechnut Sales Agent

The Beech-Nut Packing Co. has announced the appointment of Sheffield Chemical Co., Inc., Norwich, N. Y., as Sales Agent for the sale of Beech-Nut Polyvinyl Acetate Resins.

Sheffield Chemical Co., a Division of National Dairy Products Corp., will service the continental United States with the exception of the Eastern Div. Wyrough & Loser, Trenton, N. J., continues as Sales Agent in the Eastern Div., comprising the New England and middle Atlantic States.

Sheffield will sell the acetate resins through its Industrial Chemical Div., in addition to its own line of casein and casein derivatives. These new Polyvinyl Acetate Resins will be offered to the paint, adhesive, floor covering, and textile trades, and for specialized coatings, in both solid and emulsion form.

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### R. I. Plant Purchased

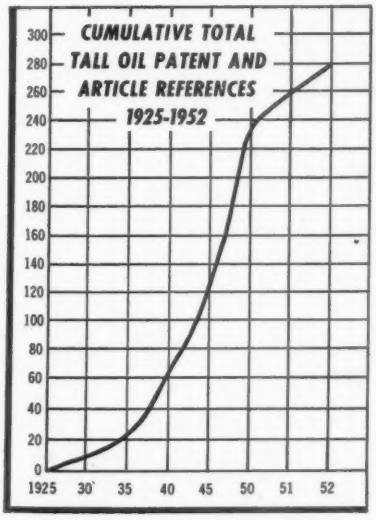
Pittsburgh Plate Glass Company announced an agreement providing for the purchase of Barreled Sunlight Paint Company with producing plant and headquarters at Providence, Rhode Island.

# TALL OIL unitol NEWS

*Union Bag & Paper Corporation • Chemical Sales • 233 Broadway, New York 7, N. Y.*

## ACCELERATED RESEARCH PACES GROWING USE OF TALL OIL

Increasing importance of tall oil to industry is disclosed by survey of current research activity. Institute of Paper Chemistry's Bibliography Series lists 1,200 references to articles and patents on tall oil. First patent, taken out in 1890, was followed slowly by others until 1925. Recent spurt of interest is indicated by fact that in 1952 (last year of tabulation) there were as many references as for the 35 year total, 1890-1925. Today an average of eight to ten patents or articles with references to tall oil are published each month.




### COATINGS INDUSTRY REFERENCES

Formulating in the coatings industry is as much an art as a science. Formulations frequently are not divulged. The Bibliography Series nevertheless lists 292 references in this field alone, approximately 25 per cent of the total.

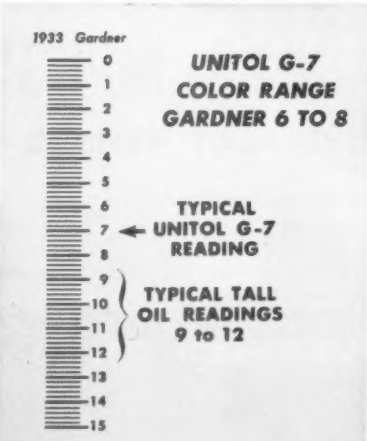
The increasing references to tall oil in research literature are illustrated in the accompanying table. It is generally accepted that a strong correlation exists between the growing frequency of these references and the increasingly wide acceptance of the new and improved grades of tall oil in the coatings industry.

# UNITOL G-7 Gains Acceptance by Resin and Varnish Makers

## Improved Color and Drying Characteristics Recognized

### Expected to Double Uses in Paint and Varnish Formulations

SHIPMENTS OF G-7 ON WAY. Tank car shipment of Unitol G-7 from Savannah is typical of stepup to production to meet paint industry requirements. Introduction of Unitol G-7, with improved characteristics, is expected to double usage of tall oil in selective paint and varnish formulations. Standing on tank car, W. O. Ralls, Supt., Union Bag's Tall Oil Plant; on track, left to right, A. B. Doran, Chem. Sales Dept., Union Bag; Dr. E. E. McSweeney, Mgr. Chem. Research, Battelle Memorial Institute; Dr. M. L. Taylor, Tech. Dir., Union Bag; R. R. Chase, Supt., Chem. Devel. Dept., Union Bag.




Initial, highly successful results with Unitol G-7, Union Bag's new, refined tall oil, have been confirmed by further experience of resin and varnish makers who have since employed G-7 in their formulations.

G-7 gained immediate acceptance for its lighter color and color retention properties when it was first placed on the market a few months ago. Several reliable and independent sources now report this new, lightest grade of Unitol also has the additional important advantages of much improved dry and, when properly formulated, elimination of after tack.

### MEETS RIGID REQUIREMENTS

Unitol G-7 may be used in the formulation of many end products or coatings which have to meet severe standards of lighter color, improved dry and less staining. Ease of handling, faster esterification rate, and lower acid number on total solids at equivalent viscosity are additional incentives for conversion to G-7.

### INQUIRIES INVITED

Regardless of whether your company now uses tall oil, you are invited to inquire about this new, improved product. You may find that, without sacrifice of quality, you can considerably reduce your raw material costs as well as simplify your manufacturing operation. Samples, specifications and additional information on request.

## BATTELLE MEM. INST. REPORTS FAVORABLE ON UNITOL G-7

Resins and varnishes from Unitol G-7 are light enough in color to allow formulating in whites and light tints, reports Battelle Memorial Institute on basis of tests made by its coating laboratories. A significant improvement in lack of staining in pigmented films also is pointed out by Dr. E. McSweeney, Manager, Chemical Research. Institute's evaluations also indicate that many types of films made from Unitol G-7 indicate better drying properties than similar films made from other refined grades. These findings have since been confirmed by many coatings manufacturers in their own tests and in actual production use.

## Personnel Changes

### CROWN CORK & SEAL

**George Congdon** has been promoted to assistant manager of research of the Can Div., according to a recent announcement by George W. Crabtree, vice-president of the company and general manager of the division. He will assist Earl Graham, manager of research, in all phases of research activity and specifically he will head up the customer research department where technical assistance is made available to the company's can customers.

### FARNOW, INC.

**Ben Shandler** has joined the Technical Sales staff. For the past ten years he has served the coatings industry as a technical sales and service man. Prior to this he was with the Paramet Chemical Corp. in research, production and technical sales. He obtained his BS degree in chemistry at New York University in 1933. He will represent the company in a technical sales and service capacity encompassing their complete line of varnishes and alkyds.

Ben Shandler

### AMERICAN CYANAMID

**Ernest K. Hunt** has been appointed Public Relations Manager. He is former Advertising Manager of both the Organic Chemicals and the Pigments Divisions. He began his eleven year career with the company in the former Calco Chemicals Div., where he served as Advertising Manager of the Household Products Dept.

D. Keller

E. K. Hunt

**David Keller** has been appointed a Sales Representative of the Pigments Div. His headquarters and territory will be in the metropolitan New York area. He joined the company in 1949, in the Pigments Technical Service Laboratory at Bound Brook, N. J. In 1951 he was appointed group leader of the Surface Coating Section, supervising research inquiries dealing with the application of pigments in paints.

### NOPCO

**Travis V. Rankin** has been appointed general sales manager in charge of sales of all products of the Pacific Div., according to an announcement by Thomas A. Printon, president and chairman of the board. He replaces **Harold A. Swanson,** who has become assistant vice president in charge of the Vitamin Div. **Walter E. Brewer** takes Mr. Rankin's place as Central District sales manager. He will also continue as manager of the Eastern Industrial Sales District.

### SINCLAIR CHEMICALS

**J. B. Willis,** assistant to the vice president in charge of research, has been appointed chief process engineer. In 1940 he was employed in the Engineering Div. of the Research Dept., in Chicago. In 1946, after five years in the United States Army and Air Force, he returned to the Research Department in the Process Design Div. and in 1950, was transferred to the Technical Dept. in Houston, Texas, becoming Administrative Assistant at that plant in 1953. In 1954 he was appointed assistant to the vice president in charge of research, Sinclair Refining Co. in New York.

**Earl Noblet** has joined the Market Development Dept., according to John A. Scott, executive vice president. Since 1949 he has been employed by American Cyanamid Co.

## GENERAL ELECTRIC

Dr. **John A. Loritsch** has been appointed Manager of the Chemical Materials Department's alkyd products plant, according to an announcement from S. L. Brous, General Manager of the department. After service as a chemist with Rohm & Haas, Dr. Loritsch joined GE's research laboratory in 1940 as a research chemist.

J. A. Loritsch

He became a Group Leader in the Chemical Division's Resin and Insulating Materials Dept. in 1945. Three years later he was named section engineer in charge of insulating materials in the division.

In 1950, Dr. Loritsch became section engineer, responsible for product development engineering, and in 1951 he was appointed Manager—Alkyds Engineering, the position preceding his present appointment.

## KOPPERS

**C. H. Teller** has been appointed Production Manager for the Tar Products Div., it was announced by F. L. Byrom, Manager of Operations for the Division. He has been with the company since 1943. Prior to his new appointment, he was Manager of the Division's Engineering Dept.

Succeeding him is **C. T. Barker,** former Assistant Manager, Technical Dept. He has been with the company since 1927.

**C. E. Brown** has been appointed Production Manager of the Follansbee, W. Va., plant, largest in the Tar Products Div. His position is a newly created one. He has been with the company since 1949 and was Manager of the Division's Production Dept. in Pittsburgh, Pa.

**M. D. Chamberlain** has been appointed Assistant Manager, Technical Dept. of the Division.

## ARIZONA CHEMICAL

**Henry C. Zeni** has been named Sales Manager of the company, it was announced by R. E. Sumner, President.

He began his sales career in 1925 when he joined A. Klipstein and Co., a chemical firm acquired by Cyanamid in 1931. Mr. Zeni transferred from Cyanamid to Arizona following his military service in 1946. As Sales Manager, he will report to A. Scharlachter, Vice President.

Arizona Chemical is jointly owned by American Cyanamid Co. and International Paper Co.

## BAUER-BROWN

**Austen A. Robinson** has joined the company's sales staff. His territory will include Louisville and surrounding areas.

The appointment is part of an expansion program. The company handles petroleum solvents, chemicals and allied products for the paint industry.

## CELANESE

**Robert H. Kampschulte** has been named General Sales Manager, Chemical Div., it was announced by R. W. KixMiller, General Manager of the Division. Mr. Kampschulte joined the company in 1947 and has been Assistant General Sales Manager since 1952. He succeeds **John W. Stevens,** resigned.

## CARBOLA CHEMICAL

**Leonard J. Rogers** has been appointed Technical Representative for the Mining and Minerals Div. He will service the northeastern part of the country, bounded on south by Maryland. He comes to the company from the Wesco Waterpaints Div. of National Gypsum Co., and was previously with Valspar Corp. He is a chemical engineering graduate of New York University and has also completed the Surface Finishes studies offered in the College of Engineering's Graduate Div.

L. J. Rogers

## GLIDDEN

**Lowell H. Miller** has been appointed industrial sales representative for the Company's Nubian Industrial Div. it was announced by Thomas N. Armel, Manager, national industrial sales.

His career in the field of industrial finishes began in 1925 when he joined the Dodge Brothers Motor Car Co. as a paint chemist. Subsequently, he served as a chemist and paint engineer for the Frigidaire Div. of General Motors Corp. and as chief chemist and paint engineer for the Norge Div. of Borg-Warner Corp. Prior to his present appointment, he helped establish and served as manager of the Vedoc Paint Div. of Ferro Enamel Co.

Mr. Miller joined Glidden last year as a Pacific Region industrial sales representative in Los Angeles. He will now make his headquarters at the division offices in Chicago.

## SHERWIN-WILLIAMS

**Vincent L. Sahli** has been appointed technical service representative for the Auxiliaries Div. of the Sherwin-Williams Co., according to an announcement from S. B. Coolidge, vice president and director of the division. He will make his headquarters at the firm's Auxiliaries Research Laboratory in Chicago. In his new post he will provide technical service on various products including chemicals, leaded zinc oxide, lithopone and containers.

## HOOKER GLASS & PAINT

**Arthur Dole III,** Assistant Vice President in charge of Branch Operations has been appointed Vice President of the company, according to an announcement by the firm's board of directors.

Arthur Dole, III

He will continue to supervise the company's eight branch offices in Illinois, Iowa, Michigan, Wisconsin and Indiana in addition to assuming greater responsibility in the management of the company.

**Louis Rupert, Robert Lewis, Jr., and Albert Moore** have been appointed paint sales representatives, it has been announced by Robert A. Jones, General Sales Manager.

Rupert will specialize in development of new paint outlets in the Chicago metropolitan area. Lewis will serve as sales representative for the company's new Protective Coatings Industrial Div. Moore will serve as special paint representative in central and southern Illinois.

## DEVOE & RAYNOLDS

**Harold H. Flegenheimer** has been appointed Technical Director of the Newark laboratory of the Beckwith-Chandler and Jones-Dabney Divisions of Devoe & Raynolds Co., Inc., according to Clarence W. Slocum, President of Beckwith-Chandler. He has been associated with the Newark Div. in the Product Development Laboratory since 1947. He is a graduate of Cooper Union School of Engineering and the Polytechnic Institute of Brooklyn with a M. Ch. E. degree.

H. H. Flegenheimer

## BORDEN

**William L. Abramowitz** has been appointed a vice president of the Chemical Div., according to an announcement by Augustine R. Marusi, president of the division. He had been executive manager of the polyco department at Peabody, Mass., which he founded in 1945 as the American Polymer Corp. Borden acquired it in 1953. **Dr. Sidney J. Baum,** who has been in charge of its production department since 1945, will become general manager of the Peabody operation.

## BLUE RIBBON

**Leo B. Hollein** recently joined the company as Vice President and Trade Sales Manager. He started his career in the hardware industry with the American Hardware Supply Co. in 1938.

L. B. Hollein

Returning to American Hardware after serving in the army during World War II, Mr. Hollein became buyer of paints and builders' hardware. In 1951 he became Assistant Vice President in Charge of Purchases. In 1953 he was assistant to the General Manager of Hardware Wholesalers, Inc. During 1954 he covered the Indiana-Ohio area as Field Representative for Cotter & Co.

## RINSHED MASON

**Ray L. Marshall, Jr.** has been appointed Industrial Sales Representative according to an announcement from Frederick G. Weed, President. Marshall recently was Vice President in charge of Sales for the Pipe Line Coating and Engineering Co.

## NATIONAL STARCH

The Resin Div. has announced the following changes and additions to its staff:

**Harold J. Zahrndt** has been appointed assistant to James Dillon, Vice President in charge of the Resin Div. He joined the company in 1941 and has had extensive experience in finding new markets for products of the Research Dept. More recently, he has been in charge of paint work for the Resin Div. and will continue his connection with the paint industry in his new position.

**Dortley F. Tikker,** formerly Market Development Research Engineer on the west coast, has moved to New Jersey to head the marketing of resins to the paint and allied industries. Since joining the company he has introduced polyvinyl acetate emulsions and various copolymers to paint manufacturers in California, Arizona and other western areas.

**Felix P. Liberti** has joined the Plainfield paint laboratory, coming from Vita Var. He heads the paint formulation and paint resin evaluation groups.

**Burton L. Fink,** has been appointed technical representative in the New York-New Jersey area.

**Eugene Scofield,** has been appointed technical representative for the Resin Div. in Cleveland.

## REICHHOLD

**John G. Penniman** has been named manager of the newly created Emulsion Div. He was a paint production engineer immediately before joining Reichhold. He was on the research staff of Wesco Waterpaints, Inc., at the time the firm was absorbed by National Gypsum. Mr. Penniman graduated from Princeton in 1945. For his senior thesis he wrote on, "Emulsion Polymerization and Its Application to Water-Thinnable Paints." He was a Marine Corps flying officer for three years during World War II.

J. G. Penniman

## GLIDDEN

**L. F. Long, Jr.** has been appointed Industrial Sales Representative of the Nubian Industrial Div., it was announced by T. N. Armel, National Industrial Sales Manager of the Paint and Varnish Div.

In his new capacity, he will be responsible for industrial paint sales in the middle south. His previous positions with the company included assignments as Technical Service Director of the Central Industrial Div. and as National Project Development Coordinator at the company's headquarters in Cleveland.

L. F. Long, Jr.

### HEYDEN

**William J. Houston** has been appointed General Sales Manager of Nuodex Products Co., a subsidiary of Heyden Chemical Corp., according to an announcement from Thomas M. O'Neil, Vice President of Nuodex in charge of Marketing.

W. J. Houston

He joined the company in 1946 and has been manager of the Paint and Varnish Div. since 1953. He was Regional Sales Manager from 1949 to 1953 and a Sales Representative from 1946 to 1949.

### FITZGERALD AGENCY

**Pat L. Dineen** is now associated in a sales capacity with Donald R. Fitzgerald, Manufacturers Agent, Chicago, Ill. He spent eight years with Martin-Senour Co. in its research laboratory and has been with Newport Industries for the last eight years, managing the Chicago sales office the last two years.

### RINSHED-MASON

**William Oberg** has been appointed technical service representative, specializing in furniture finishes technology, according to an announcement from Frederick G. Weed, company president. He has for the past fifteen years concentrated in the field of furniture finishes.

### GOODYEAR

**Robert E. Barnum** has joined the Chemical Div. as a Field Sales Representative in the southeastern district, it was announced by C. O. McNeer, General Sales Manager of the division. His sales coverage will include Georgia, the Carolinas, Florida, Alabama, Mississippi and part of Tennessee. Headquarters will be in Atlanta, Ga., and Barnum will be engaged primarily in selling Pliolite resins and latices to the paint industry.

R. E. Barnum

Prior to taking over his new duties, he served on the production squadron and also completed a training period with the Chemical Div.

### AMERICAN CAN

**Alfred O. Morkish** has been appointed General Manager of the Company's Closing Machine Dept., it was announced by William C. Stolk, President. He had been Assistant General Manager of the department. Beginning his career with Canco in 1930 as a mechanical assistant in the Equipment dept. He was appointed in 1942, Assistant Manager of the St. Louis torpedo factory operated by the company's wartime subsidiary, The Amertorp Corp. He became Manager of the torpedo plant in 1945.

When the war ended, he returned to the Equipment Dept. in New York as assistant to the manager of the Closing Machine Div. He spent about a year on special assignment with the General Sales Dept., after which he became Assistant Manager of the Equipment Dept. He was named Assistant General Manager of the Closing Machine Dept. in 1950.

### CRESAP, McCORMICK & PAGET

**John J. Levenson, Jr.,** former Director of Research and Development of the Boston Varnish Co. and later an official of Reichhold Chemicals, Inc., was appointed a senior associate of this management consultant firm with offices in New York and Chicago.

He joined Boston Varnish Co. as director of research and development in 1946 and was instrumental in organizing that firm's research programs on synthetic resins, polymers, drying oils, varnishes and organic-chemical raw materials. In 1950 he was appointed technical advisor to the chairman of the board of Reichhold Chemicals.

R. S. Mathews

E. F. Vesely

### A-D-M

**Robert S. Mathews** has been appointed Manager of the newly formed Vinyl Plasticizer Dept., it was announced by Thomas L. Daniels, President of the company. He will have charge of the sales and product development work on this group of products.

Mathews started with the company in 1937. He has been a member of the Technical Sales Service Staff, Manager of the Cleveland, Ohio branch office, Sales Manager for marine oils, and was named sales manager for chemically modified oils a year ago.

The transfer of **Edmund F. Vesely** to the Vinyl Plasticizer Dept. was also announced. He will serve as a technical sales representative for eastern markets, and will headquarter in New York. Vesely became associated with the company last year when it purchased the Resin Div. of U. S. Industrial Chemicals.

### COMMERCIAL SOLVENTS

**William J. Shea,** has been assigned to the Chicago district office. He was formerly with E. F. Drew & Co. and with Turco Products, Inc. **Nicholas Lentine,** who has been with the company since 1949 handling pharmaceuticals sales, has been assigned to the Detroit district office.

Both appointments are to the sales staff of the Industrial Chemicals Dept. They were announced by F. E. Maple, General Manager of the department, a unit of the Petro-chemicals Div.

### STANDARD-TOCH

**F. C. Wehrman** has been appointed eastern New England Technical Sales Representative. He will service the eastern Massachusetts, Rhode Island, New Hampshire and Maine industrial manufacturing areas.

He was affiliated with Castor Oil Products Co. as a chemist before joining the editorial staff of *Organic Finishing*, where he served as engineering editor for three and one-half years. It was under his editorship that the first *Guidebook-Directory for Organic Finishing* was published in 1948. He also served as associated editor of *Metal Finishing* trade journal.

### UNION CARBIDE

**Dr. A. B. Steele** has been appointed Manager and **C. P. McClelland** Assistant Manager of Technical Service for Carbide and Carbon Chemicals Co., a Division of Union Carbide and Carbon Corp., according to an announcement by John A. Field, Vice-President of the company. This newly-created unit will be responsible for rendering special technical assistance to customers.

Dr. Steele joined Carbide's Fellowship at Mellon Institute in Pittsburgh, Pa. as a trainee in 1941 and was appointed Senior Fellow in 1950. His headquarters will be in New York.

Mr. McClelland joined Carbide's Fellowship at Mellon Institute in Pittsburgh, Pa. as a sales trainee in 1936. He was appointed a Product Manager in the Fine Chemicals Div. in 1944 and has been responsible for the market development of surface-active agents, polyethylene glycols, and hydroxyethyl cellulose.

### PFIZER

**Reginald Robinson** has been assigned to represent the Chemical Sales Div. in the San Francisco area, Frank F. Black, Sales Manager, has announced. He succeeds **Edward A. Poleselli,** who is being transferred to the headquarters of the Pfizer International Subsidiaries, New York.

Mr. Robinson has been with the University of Calif. Radiation Laboratory. He was previously associated with the Union of Richfield Oil Company in an engineering capacity.

**DRAVO**

**H. W. North** has been appointed Chief Engineer of the newly established Process Equipment Dept. of the company's Engineering Works Div.

H. W. North

He has had more than 25 years of specialized experience in the process equipment field, having served in various project engineering capacities with Celanese Corporation of American, Tennessee Eastman Corp., Dow Chemical Co., and the Patterson Foundry and Machine Co., after which he organized The H. W. North Company of Erie, Pa. His headquarters will be at the company's Neville Island, Pittsburgh, office.

**KOPPERS**

**Dr. E. W. Volkmann** has been appointed Manager, Research Dept., it was announced by W. F. Munnikhuysen, Executive Vice President. He will be responsible for the coordination of the company's entire research, including work at its Verona, Pa. Research Center.

At the same time, it was announced that **Dr. A. R. Powell,** who has been Acting Manager of the department, has been appointed Special Research Adviser and will be available for advice on all research and development problems.

Dr. Volkmann joined a predecessor company of Koppers as a chemical engineer in 1926, leaving in 1931 to complete his post graduate work. He returned to Koppers in 1934 as Assistant Technical Director of its Tar and Chemical Div.

In 1940, Dr. Volkmann became associated with the Research Dept. and in 1952 was appointed Associate Director of the department. Last fall he was assigned to the overseas staff in Europe as a technical specialist for the Tar Products Div.

One of the nation's leading scientists in coal chemical technology, Dr. Powell was associated with the United States Bureau of Mines in Pittsburgh, Pa., from 1919 to 1923. During 1923 he also held a Koppers fellowship at the Mellon Institute of Industrial Research.

From 1923 until 1928, he held the post of research chemical engineer in charge of large-scale research at the Chicago plant. In 1928 he was placed in charge of the company's Seaboard experiment station at Kearny, N. J., and four years later was named Assistant Manager of the Research Dept. in Pittsburgh. In 1949 he was named Associate Manager of the department and last year was appointed Acting Manager.

**EVANS RESEARCH**

**Arthur E. Gabriel** has been appointed to the staff as Research Project Leader, according to an announcement from Dr. Ralph L. Evans,. President.

Mr. Gabriel, formerly of Armour Research Foundation of Illinois Institute of Technology, is a member of the Adhesives Subcommittee of the American Society for Testing Materials. He has also carried on research and development in resins, laminates, rubber, adhesives, coatings, plastics, and paints at Ellis-Foster Co., American Hard Rubber Co., and the United States Forest Products Laboratory.

**PABCO**

**G. H. Vincent** has been appointed manager of the paint and gypsum products plant in Southgate, Calif., it was announced by J. H. Havard, vice-president.

He replaces **L. I. Crabbe** who has retired and who will serve as a gypsum consultant for the company. Vincent has 27 years' experience in the gypsum industry. For the past two years he has served as production supervisor in the company's plant in Emeryville, Calif.

## PRODUCTION CLUBS

(*From page 40*)

formation of isophthalic alkyds are: (1) isophthalic esterifies more rapidly (2) higher molecular weight polymers and higher viscosity resins are available (3) greater heat stability is exhibited by isophthalic alkyds. Concerning the method of cooking isophthalic alkyds, Dr. Butler stated that isophthalic alkyds can be cooked by the solvent cooking process but that the same results are not obtained as with phthalic anhydride. For new resin cooking installations, however, fusion cooking is recommended by Dr. Butler.

Referring to the modifications which can be made to reduce the functionality of isophthalic, Dr. Butler stated that benzoic acid can be utilized as a replacement for part of the fatty acids or part of the isophthalic. As an alcohol replacement, ethylene glycol can be substituted for part of the glycerin. In comparing the different modifiers, Dr. Butler stated that harder resins are available when modified with benzoic acid but that alkyds modified with ethylene glycol reduce faster than those alkyds modified with benzoic acid. Several additional benefits derived from the use of isophthalic are the greater mildew resistance displayed by isophthalic alkyds and the absence of phthalic odors and tastes. Additional resins which can be made with isophthalic acid are styrenated alkyds, silicone modified alkyds, and unsaturated polyester resins. The advantages which can be obtained from the use of isophthalic acid in unsaturated polyester resin are a higher melting point, a more viscous isophthalic polyester resin with styrene, greater flexural strength and impact resistance, and higher heat distortion temperatures.

In conclusion, Dr. Butler gave the following summation of the advantages derived from isophthalic:

(1) Higher molecular weight polymers making alkyds more tough and durable than comparable phthalic alkyds, and polyester resins, which are stronger and less brittle. (2) Excellent drying times. (3) Better heat stability which allows cooking at higher temperatures. (4) Lower sublimation losses. (5) Higher oil length alkyds exhibiting better weathering properties at less cost.

### NORTHWESTERN

The Feb. meeting was held at the Town and Country Club, St. Paul Minnesota. It was called to order by President Elmer Stark. The minutes of the Jan. meeting approved as read.

Mert Hilke, Chairman of the Program Committee, announced that the Mar. meeting would feature Dr. W. Bosch Head of the Paint School at North Dakota State College, whose subject will be "Paint Research at North Dakota State College, Past, Present and Future." He will also report on the progress of the Corrosion Committee.

John Rouse, Chairman of Membership Committee, gave the first reading of the following names for Class A membership: Jim Porter of Colwell Press; John E. Wiff of Speed-O-Lac Pt. Co.; Richard W. Hoff of North Star Varnish.

President Stark announced the appointment of Jim Stanton of Minnesota Paints as Chairman of the 1955 Technical Committee to replace Dick Radford who left the club.

A letter from President Beckwith of the Federation of Paint & Varnish Production Clubs was read announcing a program for increasing the Federation's membership.

Mert Hilke introduced Dr. Willard Madson of the DuPont Corp. His subject was "Trends in Colored House Paints." Dr. Madson divided his subject into three parts:

(1) Bright color house paints made with oil.

(2) Bright color house paints made with Alkyds.

(3) Bright color house paints made with Emulsions (PVA & Acrylic type)

Dr. Madson showed the effect of the proper inert selection on the color retention in oil and alkyd type house paints. The effect of different pigment volume concentrations was shown. He mentioned that caution is required in the use of alkyd type house paints on repaint surfaces and that excellent results are obtained on new wood.

Emulsion type paints show promise as masonry paints. They have excellent color retention, ease of application, lack of flashing and show good adhesion on asbestos shingles and Southern Yellow Pine, according to Dr. Madson.

Dr. Madson illustrated his talk with numerous slides from DuPont's test fences in Delaware and in California.

## KANSAS CITY

The Feb. meeting was held on the 11th at the Town House Hotel in Kansas City, Kansas with 65 members and guests present.

The minutes of the previous meeting were not read because of their length. They were assumed correct and accepted as written.

Guests at this meeting included the Board of Directors and Finance Committee of the Federation of Paint and Varnish Production Clubs. President Wormser introduced the following guests: President Newell P. Beckwith; President Elect Clyde L. Smith; Treasurer Milton A. Glaser; Executive Secretary C. Homer Flynn; R. Adams, John E. Hoffmeyer, Robert W. Matlack, Eugene H. Ott, Calvin J. Overmyer, Howard G. Sholl, James W. Tomecko, Loren B. Odell and Dr. Charles Moore.

Also introduced were the following members of Du Pont: Dr. Willard H. Madson, Charles Opperman and Mr. W. Lawton.

Introduced as guests of the local club were Barney Fink of the Longwear Paint and Varnish Works and Dick Radford of the Seidlitz Paint and Varnish Co., who was welcomed back. Neil Masters of the Iowa Paint Co. in Des Moines, Iowa had journeyed to visit the club. Additional guests were officers of the Kansas City Paint, Varnish and Lacquer Association: D. Eichelberger, President; J. Seidlitz, Vice President; T. Terhurst, Secretary; and A. Anderson, Treasurer.

Mr. Niewrzel reported for the Technical Committee and stated that the second round of the proposed test for sagging was half-way through and that the other half should be completed in about three weeks. At that time the Technical Committee will meet and consider writing the paper.

H. Koehn made the report for the Joint Meeting of the Kansas City Paint and Varnish Production Club with the St. Louis Club which will be held on Mar. 12, in Kansas City, Missouri at the Phillips Hotel. Mr. Koehn reported that the speakers were all lined up and the final notices would be mailed out early the following week.

President Wormser explained the role of the Kansas City and St. Louis Paint and Varnish Production Clubs in extending an invitation to the students and instructors involved at the Rolla School of Mines to attend the Joint Meeting in Kansas City. He explained that this was a joint financial responsibility of the St. Louis and Kansas City Clubs.

President Wormser introduced Newell P. Beckwith, President of the Federation of Paint and Varnish Production Clubs who expressed appreciation for the arrangements made for what appeared to be the first meeting in Kansas City of the Board of Directors and Finance Committee. President Beckwith named those members of the Kansas City Club who were represented on National Committees in the Federation and paid tribute to their work, particularly that of Mr. Vasterling, the council representative.

President Beckwith stressed that a drive should be made for additional members and stated specifically Class E of which there were only two members in the whole Federation. He suggested that perhaps the students at the Rolla School of Mines would be interested in the group. Also mentioned were Class B members who are

of great help to the various technical committees in our industry. The Federation Council of which Mr. Vasterling is a member has been exceptionally active. An invitation to the annual meeting on Oct. 3 to 6 at the Statler Hotel in New York City was extended to all those present. This is the first time that an independent meeting is being attempted.

The Official Digest was stressed by Mr. Beckwith as being a very high-type journal which would cost substantially more if purchased individually without regard to the cost of advertising which defrays the expenses to a very great extent.

President Beckwith introduced President Elect Smith who pointed out that the principal job of the President Elect is becoming acquainted with the various members around the country. His official duty is presiding over the club officers on Oct. 3, 1955.

President Wormser pointed out that this meeting was the occasion of the 25th anniversary of the Kansas City Paint and Varnish Production Club as such. There actually were prior meetings of a smaller group under another name for a year or so before the formal founding of the club.

President Wormser introduced the Du Pont men who accompanied the scheduled speaker to our city. Dr. Willard H. Madson delivered the paper of the evening: "New Trends in Colored House Paints."

### ST. LOUIS-KANSAS CITY

The annual joint meeting of the St. Louis-Kansas City Paint and Varnish Production Clubs will be held Mar. 12 at the Phillips Hotel, Kansas City.

The principal paper, "The Use of Basic Properties in Paint Evaluation and Modern Trends in Formulations," will be presented by Sidney Werthan, Supervisor, Paint Laboratory, Research Div., New Jersey Zinc Sales Co. The paper is based on rapid changes in paint technology and is applicable to present day paint problems in all size plants.

Aiding Mr. Werthan will be a panel consisting of Dr. Calvin J. Overmeyer, Elliott Paint & Varnish Co., Moderator; Dr. M. C. Londergan, E. I. Du Pont Co.; Dr. Clovis Adams, Sherwin-Williams Co.

## Milton A. Lesser, 47, Dies; Magazine Editor, Author

Milton A. Lesser, 47, Technical Editor of *Drug & Cosmetic Industry*, died on January 31 at his home in Brooklyn, N. Y. after a long illness.

Mr. Lesser was a widely-known authority on the application of glycerine, and for many years a consultant to the Glycerine Producers Association. He was the author of many technical papers, and of the textbook "*Glycerine: Its Industrial and Commercial Applications.*" His book "*Modern Chemical Specialties*" was published in 1950.

He was a member of the American Chemical Society, American Association for the Advancement of Science, New York Academy of Sciences, and the American Pharmaceutical Association.

Surviving are his widow, Rose; and two children, Paul, 14, and Martha, 10.

## ODOR CONTROL

(*From page 33*)

effective deodorization is not a matter of compounding an agreeable perfume which merely conceals underlying odors. Rather, the offensive odor itself becomes an integral component of the final result. To achieve it, aromatic oils are blended to produce a complementary scent of such character that its addition to the odor evolved by the paint results in their mutual cancellation. Available to the odor technician for this purpose are more than 1,500 aromatic chemicals and essential oils which make possible an almost infinite number of combinations.

The next step is to determine the minimum concentration required to produce the desired effect. This may appear to be a simple matter; actually, it is vastly complicated by the fact that individual sensitivity to given odors varies over wide limits. A concentration which may seem to the chemist to provide full masking of all the objectionable notes present may strike another individual as wholly inadequate, while to another the paint may seem to be perfumed. Still other noses will detect other nuances of scent.

Psychologically, it is preferable to leave a very faint odor of paint (since that is the scent one expects to find in a newly painted room) rather than to cross the line of neutralization in the other direction. Because perfume is such a highly individual means of self-expression, it is more than probable that most people, and especially women, would react unfavorably to a scented paint. So, even when due allowance has been made for varying sensitivity to different odors, the concentration is generally held to a point just short of complete neutralization.

### Evaluation

Finally, to verify their results from the standpoint of the average paint user, chemists at van Amerigen-Haebler make up samples of the paint with different concentrations of the masking agent and submit them to a panel of men and women for an expression of opinion.

This is done in the following manner: the deodorant is added to three samples of the paint in varying proportions. A fourth sample is left untreated to serve as a control. Then each of four corrugated paper boxes 6″ x 6″ x 14″ is painted on the inside with one of the samples. Boxes and samples are identified only by letters or numbers, the meaning of which is unknown to the panel.

Sixteen hours after painting each member is asked to select the two boxes which in his or her opinion have the minimum of odor and then to choose which of these two he or she considers to have the least odor of all. The boxes are then sealed with cellophane tape and left until 48 hours after painting have elapsed. Now the panel is asked once more to select the box with the least odor.

If the masking agent has been successfully formulated, an overwhelming majority will pick the same box both times. The significance of such a response pattern is twofold: 1. it means that the deodorant successfully combats both the immediate and the more lingering odors; 2. it is a check on the optimum concentration of deodorant to achieve the desired purpose.

It is noteworthy that these surveys show women to be more sensitive to paint odors than men; they eliminate their dislikes more promptly and with greater assurance, and they are quite consistent in rechecking their selections.

Concentrations as low as 0.025% may be sufficient to mask the odor of latex base paints, and rarely does any formulation require a higher proportion of deodorant than 0.1%.

Cost is nominal in view of the substantial sales benefits conferred by odor-masking. Where the concentration is of the order of 0.03%, 10,000 pounds of paint can be rendered odor-free for about $4.50. In practically every instance, cost of deodorization is but a fraction of a cent per gallon. The indisputable consumer preference for odorless paints suggests that such a cost level represents a very modest investment in product improvement.

# PATENTS

Complete copies of any patents or trade-mark registration reported below may be obtained by sending 50c for each copy desired (to foreign countries $1.00 per copy) to the publisher.

### Plasticized Nitrocellulose

*U. S. Patent 2,699,400 . . John D. Brandner, Wilmington, Del., assignor to Atlas Powder Company, Wilmington, Del., a corporation of Delaware.*

A nitrocellulose coating composition comprising one part by weight of a soluble nitrocellulose and, as a plasticizer for the nitrocellulose, from about 0.1 to about 1.0 parts by weight of di (beta phenoxyethyl) diglycolate.

### Modified Polyvinyl Acetal Compositions

*U. S. Patent 2,700,028 . . Charles H. Jarboe, Louisville, Ky., assignor to E. I. du Pont de Nemours and Company, Wilmington, Del., a corporation of Delaware.*

A composition of matter comprising polyvinyl butyral and from 0.05 to 5% of 2-imidazoline-2-thiol based on the weight of the polyvinyl butyral.

### Copolymer Resins

*U. S. Patent 2,698,840 . . Elizabeth Dyer, Newark, Del., and George A. Weisgerber, Iselin, N. J., assignors to Armstrong Cork Co., Lancaster, Pa., a corporation of Pennsylvania.*

A clear, hard, resinous copolymer of a monovinyl aromatic compound and the product obtained by esterifying linoleic acid with 1,2-dihydroxy-3-butene.

### Buffing Composition

*U. S. Patent 2,699,990 . . Harvey E. Larsen, Steger, Ill., assignor to Steger Products Manufacturing Corporation, Steger, Ill., a corporation of Illinois.*

A composition suitable for use in cloth-buffing of lacquered furniture, that consists essentially of (*a*) 3-5 parts of a rubbing compound of 16.5 weight per cent aqueous alkali metal soap of fatty acids of 60 weight per cent solids content, 45.5 weight per cent tripoli, 21.5 weight per cent kerosene and 16.5 weight per cent water; (*b*) 3 parts of a soap composition of 36 weight per cent aqueous alkali metal soap of fatty acids of 40 weight per cent solids content, 1 weight per cent pine oil and 63 weight per cent water; and (*c*), as a diluent, 1-5 parts of water.

### Preparation of Phthalocyanine Pigments

*U. S. Patent 2,699,440 . . John W. Eastes, Somerville, and Theodore F. Cooke, Martinsville, N. J., assignors to American Cyanamid Company, New York, N. Y., a corporation of Maine.*

The method of producing a finely-divided, tinctorially strong, non-crystallizing, red shade, beta form metal phthalocyanine pigment which comprises subjecting a phthalocyanine pigment prepared in an autoclave in the presence of a saturated alicyclic hydrocarbon solvent and thereafter acid-pasted, to treatment with an aliphatic isocyanate at a temperature of about 90° C. to about 140° C.

### Copolymerization of Styrene and Drying Oils

*U. S. Patent 2,698,839 . . Stanley Erwin Bradshaw, Tunbridge Wells, and Edward Michael Evans, Tonbridge, England, assignors to British Resin Products Limited, London, England, a British company.*

A process which comprises copolymerising, by the action of heat, a styrene compound selected from the group consisting of styrene, alphamethyl styrene and their polymerisable nuclear chlorine, methyl and ethyl substitution derivatives with a vegetable drying oil in the presence of a transfer agent selected from the group consisting of carbon tetra chloride, ethylene dichloride and tetrabromethylene.

# abstracts

### Developments of Anti-Fungicidal Paint Finishes

*By P. P. Hopf: Paint Manufacture (London), vol. 23, No. 2, pp. 49-50.*

For protection against attack by fungicides and bacteria, paint finishes for hospitals, bakeries and food storages, are conditioned with fungicide poisons which must be effective against a great number of micro-organisms but which should not adversely affect the characteristics of the finish film. Further, the preserving agent should be slightly but definitely soluble in the plasticiser of the finish, should withstand high and low temperatures on baking ovens and refrigerators and should be stable against ultra-violet light. Finally, it should not smell, not adversely influence the color tone stability and washing down characteristics of the finish, and not unduly affect white finishes.

The copper salt of 8-hydroxyquinoline is certainly highly effective but must be used in amounts of about 7.3 p.c. and is accordingly unusable for light finishes. A phenyl-mercury compound of 8-hydroxyquinoline (the Phenox compound of Ward, Blenkinsop & Co. England) which is effective in amounts of 0.3 p.c. does not have these disadvantages, since it is usually additioned to the pigment and then uniformly diffused into the vehicle. This fungicide toxine can also be first dissolved in aluminum stearate or another metal soap. As it is non-volatile and insoluble in water, finishes formulated in this manner are nonpoisonous to human beings.

### Drying Oils Esterified With Pentaerythritol

*By S. Gourley: Paint Manufacture (London), vol. 24, pp. 147-148, (1954).*

Pentaerythritol ester of the linseed oil fatty acids is produced by direct esterification at 250° C. under reduced pressure. They have an SZ+5, a hydroxyl content of 0.8 p.c. and a viscosity of 1 poise at 21.5° C. They are substituted for normal linseed oil standoil (30 poise) in combination with normal commercial hard resins in a ratio of 3 parts of oil to 1 part of resin. It has already been previously found that the pentaerythritol esters polymerize more rapidly and give harder films. The better exterior stability is also indicated in the present work.

The hard resins chosen were: pentaerythritol resin ester with pentaerythritol or glycerine resin ester modified with phenol-formaldehyde or malic acid and a glycerine resin ester modified with diphenylolpropane formaldehyde, from various producers. The lacquers were pigmented with titanium dioxide (26.3 vol. p.c. of the dry film). The coatings on wood were tested for periods of 8, 16 and 24 months under exterior weathering conditions for crack formation and chalking. With eight out of the nine lacquers investigated, a definite improvement in quality was shown. A pentaerythritol-malic acid resin showed the best results. The more rapid polymerization was confirmed with the production of the lacquer; the pentaerythritol ester polymerized three times as quick as linseed oil. This signifies a considerably better utilization of the paint kettle capacity installed for production. With present day oil prices, the pentaerythritol ester is 50 per cent dearer than alkali refined linseed oil and consequently, only accordingly enters into consideration if the better quality is desired. The price difference is reduced with rising oil prices. The pentaerythritol esters are also interesting for the improvement of low grade oils.

## CALENDAR OF EVENTS


Mar. **12.** Joint Meeting of the Kansas City—St. Louis Paint and Varnish Production Clubs, Kansas City.

April **4-7.** Spring Meeting of Div. of Paint, Plastics and Printing Ink Chemistry, ACS, Cincinnati, Ohio.

April **17-20.** 46th Annual Meeting of American Oil Chemists' Society, New Orleans, La.

May **6-7.** Southwestern Paint Convention of the Dallas and Houston Paint and Varnish Production Clubs. Shamrock Hotel, Houston, Tex.

May **13-14.** 8th Annual Convention of Pacific Northwest Paint and Varnish Production Club, Gaffney's Lake Wilderness Resort, Seattle, Wash.

**Production Club Meetings**

**Baltimore,** 2nd Friday, Park Plaza Hotel.
**Chicago,** 1st Monday, Furniture Mart.
**C.D.I.C.,** 2nd Monday.
Cincinnati — Oct., Dec., Mar., May, Hotel Alms.
Dayton — Nov., Feb., April, Suttmillers.
Indianapolis — Sept., Claypoll Hotel.
Columbus — Jan., June, Fort Hayes Hotel.
**Cleveland,** 3rd Friday, Harvey Restaurant.
**Dallas,** 2nd Thursday, No Fixed Place.
**Detroit,** 4th Tuesday, Rackham Building.
**Golden Gate,** Last Monday, E. Jardin Restaurant, San Francisco.
**Houston,** 2nd Tuesday, Seven Seas Restaurant.
**Kansas City** 2nd Wednesday, Pickwick Hotel.
**Los Angeles,** 2nd Wednesday, Scully's Cafe.
**Louisville,** 3rd Wednesday, Seelbach Hotel.
**Montreal,** 1st Wednesday, Queen's Hotel.
**New England,** 3rd Thursday, Puritan Hotel, Boston.
**New York,** 1st Thursday, Brass Rail, 100 Park Ave.
**Northwestern,** 1st Friday, St. Paul Town and Country Club.
**Pacific Northwest,** Annual Meetings Only.
**Philadelphia,** 3rd Wednesday, Engineer's Club.
**Pittsburgh,** 1st Monday, Fort Pitt Hotel.
**St. Louis,** 3rd Tuesday, Forest Park Hotel.
**Southern,** Annual Meetings Only.
**Toronto,** 3rd Monday, Diana Sweets, Ltd.
**Western New York,** 1st Monday 40-8 Club, Buffalo.

## Vinyl Emulsion Finishes

*By C. E. Hollis and J. H. W. Turner: Paint Manufacture (London), vol. 24, pp. 15-18, (1954).*

Emulsion finishes with the drying oils have been known since 1865 and, particularly during the last 30 years, the emulsified alkyd resins which have been placed on the market have given outstanding wash-fast finishes. With these oil-containing emulsions the individual pigment particles are surrounded by the film-forming agent (vehicle) which chemically dries in the air, while with the polymer emulsions, except for a very slow aging and weathering, no change of the vehicle takes place. The average particle size of the organic vehicle is considerably smaller with the synthetic emulsions than with the emulsified oils and this is of the greatest advantage for pigment wetting and the film formation.

The film formation phenomena were studied with the electron microscope. The small, spherical-shaped particles are sintered together by surface tension forces. The smaller the particles, the greater are these forces which act in such a manner that the intermediate spaces between the particles are filled. The difference is also described between block and emulsion polymerization. It is simpler to stir with the latter and temperature control is easier to conduct. The polymerization takes place quicker. The molecular weight of the polymers is greater. The polymerization of monomers which are insoluble in water (styrol, butadiene, etc.) is easily induced by peroxides (K-S-O-) which are insoluble in the monomers but soluble in water. The polymerization velocity is greater in the presence of soaps with initiators which are soluble in water than with those which dissolve in the monomers.

The individual polymer particles are much smaller than the drops of the original emulsified monomers; often the size relationship is about three or four. If the softening point of the polymers lies appreciably above room temperature, a powdery film is formed with the drying-out of the emulsion, as with polystyrol. In order to obtain a closed, sealed film, plasticizers must be added so that the particles flow together. This is designated as external plastification. Internal plastification is achieved by the co-polymerization of various monomers, for example, styrol-butadiene-systems. As regards the stability of the emulsion paints, it is unfavorable if the particle size appreciably exceeds 1 micron.

Apparently, there exists an optimum ratio between the sizes of the resin and pigment particles; however, other factors are of greater importance, for example, surface reactivity of the pigments and its behavior towards wetting and dispersing agents. The consistency also plays a great role. Good brushing paints often have a bad covering power and show brush marks, while more difficult brushable paints spread well and cover well. The ideal to be aimed for are paints which have a low plasticity, low viscosity and sufficient thixotropy to prevent settling in the container and "curtain" building on application. Alkyd resins are recommended as additional plasticizers; they also facilitate the pigment wetting after the phase transformation. Since an excess of plasticizer is a disadvantage, volatile plasticizers or high boiling point solvents can be introduced to improve the film formation. Naphthaline has proved particularly satisfactory, as in spite of its high vapor pressure it escapes relatively slowly from the film.

# TECHNICAL Bulletins

### LIFT TRUCK OPERATION

The sixth printing of "How to Operate a Lift Truck" has been completed and is now available free to lift truck operators, supervisors, safety engineers and other interested industrial and governmental personnel.

The two-color cartoon technique used in the 26-page booklet is designed for easy reading and is packed with information about the operation of a lift truck, preventive maintenance, safety and basic materials handling. Drawings for setting up an obstacle course are also included.

Prepared for use as part of an operator training program, it is slanted for both the beginner and the experienced operator and can be used as a guide by instructors.

The booklet is available by writing for Form 1214 to the Hyster Co., Portland 8, Ore.; or from a Hyster dealer.

### GLYCERINE ALKYDS

A booklet entitled, "Glycerine Alkyds Tailored to Need" has been issued by the Glycerine Producers' Association. They are reprints of a series of articles by Charles R. Bragdon which appeared in the *American Paint Journal.*

Mr. Bragdon, a consulting chemist and chemical engineer in the field of organic surface coatings, goes into specific cases as he selects the best alkyd for a particular requirement. Present and probable future trends in the manufacture and use of glycerine alkyds, and methods for their evaluation are discussed.

A bibliography and glycerine grades and specifications are included.

For this booklet and further information on the use of glycerine in resins and other applications write Glycerine Producers' Association, 295 Madison Ave., New York 17, N. Y.

### CHEMICAL INDEX

The second edition of the "Reilly Chemical Index" containing essential information on over 100 organic compounds, includes 13 new chemicals which have been made available since publication of the first Index two years ago.

There is a concise presentation of acetylenic alcohols, fused ring heterocyclics, hydrocarbons, phenol and substituted phenols, and pyridine and pyridine derivatives.

Copies can be obtained from Reilly Tar & Chemical Corp., 1615 Merchants Bank Building, Indianapolis 4, Ind., or the nearest company office.

### HOSE CHECK LIST

Users of industrial rubber hose will be interested in the new hose check list which shows how to obtain longer hose life and better performance. It is offered by the Thermoid Co., Trenton, N. J.

Printed in black on a yellow background for easy reading, the eleven-point list high-lights four common abuses of hose with drawings. The 8½" x 11" chart of stiff cardboard is designed for wall mounting in plant areas as a reminder that hose, although ruggedly built, can be damaged by abuse. It is lacquered for protection against moisture, oil, grease and dirt.

### TEMA STANDARDS

The Tubular Exchanger Manufacturers Association has published an Addenda to the Third Edition of the TEMA Standards for heat exchangers. The TEMA Standards, prepared by the Technical Committee of the Association, have had wide acceptance, both in this country and abroad, by the users of heat exchangers in the petroleum, chemical and other industries, as well as Government agencies.

The 1954 Addenda covers all changes and additions that have been approved since publication of the Third Edition in 1952. The Addenda supersedes the corresponding paragraphs, tables and figures published in the Third Edition.

The paragraphs on tube sheet design have been revised and enlarged, and are now identical for Class "R", "C" and "A" heat exchangers. The increased use of high pressure heat exchangers by the process industries has been recognized by the addition of a formula for shear stress in the outer tube limit circle and constants for tube sheets integral with the channel or shell wall. Also, paragraphs on flat covers for multi-pass channels have been revised and a formula added that permits extending the chart giving values for the thickness multiplier for pressure and diameter effect. The chart of thermal conductivity of hydrocarbon liquids has been revised and a new chart for thermal conductivity of normal hydrocarbon added.

Copies of the Addenda are available free to present holders of the Third Edition of TEMA Standards. The "Standards of Tubular Exchanger Manufacturers Association" can be obtained at $5.50 per copy by writing Tubular Exchanger Manufacturers Association, Inc., 53 Park Place, New York 7, N. Y.

### CALCIUM CARBONATES IN PVC RESINS

Possibilities of cost reduction with minimum effect on physical properties by using "Witcarbs" "V" and "P" in filling vinyl chloride resins are suggested in a two-page technical service bulletin, W-2, published by Witco Chemical Co., 260 Madison Ave., New York. It is available upon letterhead request to the New York address.

"Witco V" is described as a precipitated calcium carbonate of 0.2 micron particle size which disperses readily, gives high opacity and gloss to calendered and extruded goods and detracts only a minimum from physical properties. Plasticizer requirement to maintain hardness at any given level is 1.6 parts dioctyl phthalate for each 10 parts of loading.

"Witcarb P," of 0.055 micron particle size, is said to produce glossy, translucent stocks of excellent abrasion resistance and freedom from scratching and blushing. Satisfactory dispersion requires wetting pigment with plasticizer before mixing. The plasticizer requirement is 2.1 parts dioctyl phthalate for each 10 parts "Witcarb P."

## CLASSIFIED ADVERTISEMENTS

**Rates: $.20 per word, except those seeking employment, for which rate is $.10 per word. Minimum: ten words. Address all replies to Box Number, c/o Paint and Varnish Production, 855 Avenue of the Americas, New York 1, New York.**

### PAINT CHEMIST WANTED

**Young man, recent B.S. in chemistry, preferably with minor in biology. Paint laboratory and/or plant experience essential. Position involves research in industrial micro-organism control field on paints, by well established firm located in Tennessee. Write fully, giving details of training and experience. Box 310.**

### CONNECTION WANTED

M. I. T. graduate, B.S. in chemistry desires laboratory and production position. Some formulating experience, heavy experience in maintenance paint sales to chemical industry. Box 156.

### SPECTROPHOTOMETER

The entire story of the Warren Spectracord is told in a 20-page booklet published by Fisher Scientific Co., 717 Forbes St., Pittsburgh, Pa.

Announced by the company as the fastest recording-spectrophotometer commercially available, it expedites product control, and releases professional personnel for more productive laboratory work in paints, dyes and pigments, agricultural products, cosmetics, foods & beverages, glass, medicine, biologicals & pharmaceuticals, metallurgy, paper, petroleum, plastics, rubber, textiles, and chemicals.

Three pages are devoted to circuit diagrams and step-by-step explanations of the instrument's unique electronic recording and control systems.

The booklet has actual-size facsimiles of absorption spectra run on the Spectracord (benzene vapor in 4½ minutes; chloroform in 2½ minutes; didymium glass in 45 seconds) to demonstrate its high resolution, speed and reproducibility.

Another diagram shows how easily an existing DU-type monochromator is installed in the Spectracord.

Two pages give current prices, catalog numbers and details of the series of useful accessories (Time Drive, Near Infra-red, Repetitive Scanning, Linear Absorbance) now available or in development. Those wishing a copy should write for Bulletin FS-245.

### AMINES

An 8-page booklet describing the properties and characteristics of primary and secondary amines is called "Armeens," the company trade name for amines. The booklet is a revision of an earlier publication, and is one of a series of about 25 such booklets prepared by the Division on its fatty acid and fatty acid derivative products.

Amines are cationic surface active agents found useful in a wide variety of applications in the paint, oil, rubber, chemical and textile fields.

The booklet is available on request to Armour and Company, Chemical Div., 1355 W. 31st St., Chicago 9, Ill.

## ADVERTISERS' INDEX

# How HYDRITE Kaolinites affect GLOSS

## *in Polyvinyl Acetate Emulsion Paints*

Previous advertisements in this series have shown the effect of particle size distribution of HYDRITE Kaolinites on important properties of butadiene-styrene latex paints. Beginning with this advertisement, the effect of particle size on properties of polyvinyl acetate emulsion paints will be discussed.

In butadiene-styrene systems, kaolinite particle size has an important effect on gloss. The same is true in PVAc systems, however, *the degree to which it is true depends on the individual emulsion used.*

Curves at the right were obtained by using the different grades of HYDRITE Kaolinites in two internally plasticized PVAc emulsions.

Notice that in Emulsion "A", kaolinite particle size has the expected effect on gloss. In Emulsion "B", however, the effect of particle size on gloss is negligible for all practical purposes. This marked difference between emulsions indicates that an evaluation of the effect of kaolinite particle size on gloss may be a valuable means of determining an important emulsion property.

Technical Service Bulletin TSBH-12 giving further details is being prepared.

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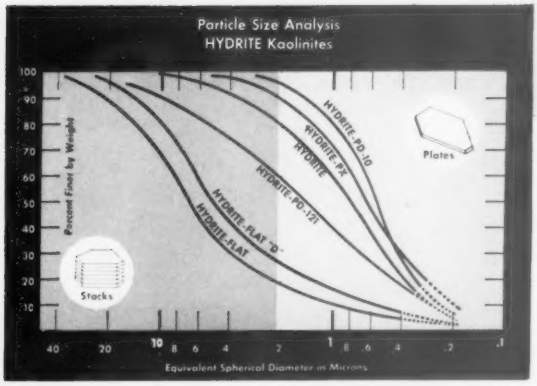
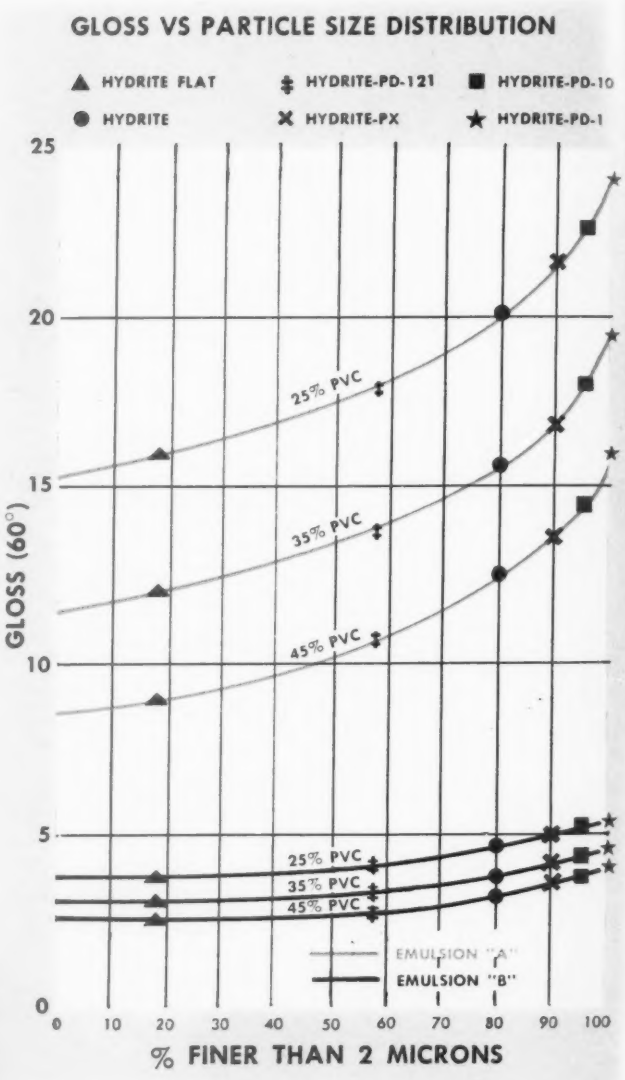
***TO RESERVE YOUR COPY!***




**#5 in a series describing the effect of kaolinite particle size on important properties of various paint systems.**




**GEORGIA KAOLIN COMPANY**

**435 North Broad Street, Elizabeth, N. J.**

# PAINT and VARNISH Production

(REG. U.S. PATENT OFFICE)

Formerly PAINT and VARNISH PRODUCTION MANAGER
(Established in 1910 as The Paint and Varnish Record)

VOL 45 APRIL, 1955 NO. 5


NEXT ISSUE

One of the vexing problems encountered in the painting of galvanized iron and steel is the difficulty with adhesion of the paint film. The May issue will carry an article entitled, "New Red Lead Paints for Galvanized Surfaces" in which the author discusses surface preparation, formulations, coating thickness as important factors in overcoming this difficulty.

## FEATURES



## DEPARTMENTS

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